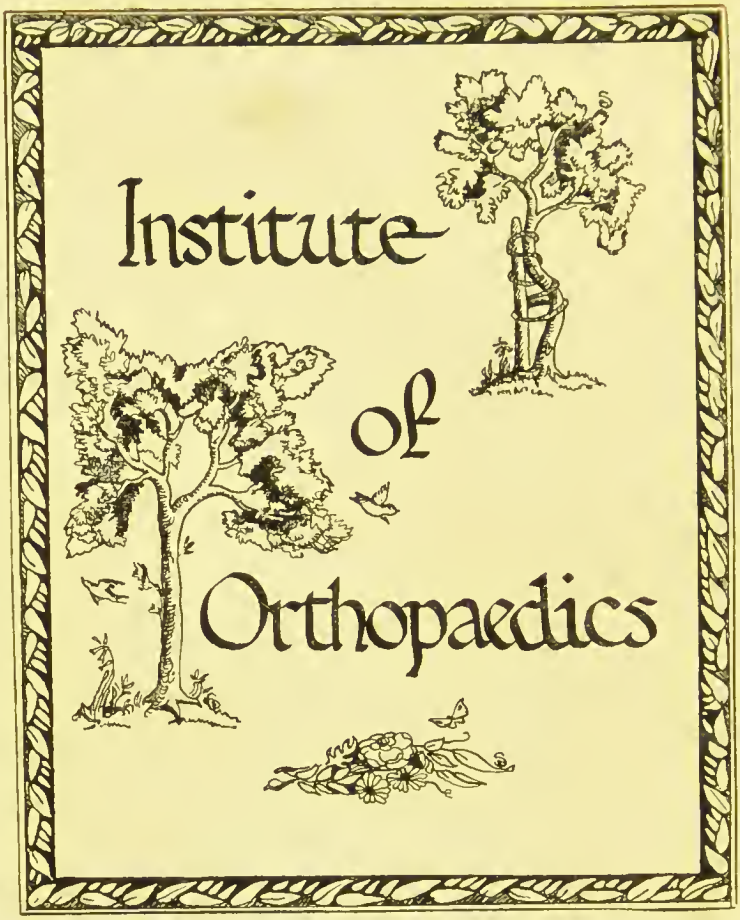

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Glasgow Medical Society

INSTITUTED

A.D. 1809.

Cum Sociis Studeo.

No 236.

CASES

OF THE

EXCISION

OF

CARIOUS JOINTS.

BY

H. PARK,

Surgeon in the Liverpool Hospital;

AND

P. F. MOREAU,

De Bar-sur-Ornain, M. D. de l'Ecole de Paris.

WITH

OBSERVATIONS BY JAMES JEFFRAY, M. D.

Professor of Anatomy and Surgery in the College of Glasgow.

Illustrated by Engravings.

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TO HIS GRACE

JAMES DUKE OF MONTROSE,

LORD CHANCELLOR OF THE UNIVERSITY OF GLASGOW,

&c. &c.

THE FOLLOWING COMPILATION,

relating to

AN IMPORTANT SURGICAL OPERATION,

Is humbly dedicated

By His Grace's much obliged

And most obedient Servant,

JAMES JEFFRAY.

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LETTER

TO

Mr PERCIVAL POTT.

BY

H. PARK,

Surgeon in the Liverpool Hoſpital.

LETTER

FROM

MR PARK OF LIVERPOOL.

SIR,

SOME months ago I mentioned to you, that my attention had been lately ſomewhat engaged in attempting what I apprehended to be a new mode of treating ſome of the affections of the larger articulations.

From the regard which you always ſhewed me whilſt I was under your roof, and from that ſteady friendſhip with which you have honoured me ſince, I am encouraged to hope you will not think I am committing too great a treſpaſs

on your patience, in giving you a more detailed account of that buſineſs, with a view, provided I have your approbation, of ſubmitting it to public inſpection. I hope that the importance of the ſubject will in ſome meaſure apologize for me, as it muſt be allowed, that, of the various injuries and diſeaſes by which mankind are deprived of limbs, thoſe affecting the larger articulations form no inconſiderable ſhare.

Scrophulous affections of the joints, commonly diſtinguiſhed by the name of White Swellings;—collections of pus in the articular cavities, originating in ſimple inflammation;—gun-ſhot wounds and compound fractures of the joints;—nay, even the moſt ſimple, penetrating wounds, however favourable may be the termination in ſome few caſes, are nevertheleſs, in ſpite of all the modes of obtaining relief hitherto diſcovered, but too frequently productive of ſuch a train of evils, as terminate at length in the deſtruction of the unhappy ſufferer, unleſs prevented by the timely removal of the limb. To enumerate theſe evils, would be only to take up your time and attention with

what is already too well known to every practitioner in ſurgery; and to attempt to adduce arguments or facts in ſupport of the above aſſertion, would be only taking pains to prove what is already pretty generally acknowledged. To alleviate in ſome degree theſe evils, and to avert ſome of the dreadful conſequences, is the deſign of theſe few ſheets; in which I hope to ſhew, that in ſome of the affections of the knee and elbow, in which amputation has hitherto been deemed indiſpenſibly neceſſary, Surgery has yet another reſource, which, as far as my reading and experience enable me to judge, has not yet been attempted by any other practitioner; and by which the limbs of perſons under the above circumſtances may yet be preſerved, with ſuch a ſhare of the motions which Nature had originally allotted to them, as to be conſiderably more uſeful than any invention which art has hitherto been able to ſubſtitute in their ſtead.

The reſource I mean, is the *total extirpation of the Articulation*, or the entire removal of the extremities of all the bones which form the

joints, with the whole, or as much as poſſible, of the Capſular Ligament; thereby obtaining a cure by means of Callus, or by uniting the Femur and Tibia, when practiſed on the knee; and the Humerus, Radius, and Ulna, when at the elbow, into one bone, without any moveable articulation.

The practicability of ſuch an operation, with a probability of ſucceſs, occurred to me ſome years ago; but as the undertaking appeared liable to many difficulties and objections, I wiſhed to avoid being too precipitate in the attempt, and therefore frequently made it the ſubject of converſation with different Gentlemen of the profeſſion. The principal difficulties that occurred, either from my own reflections, or the obſervations of my friends, were as follows, viz. the hazard of wounding the principal blood-veſſels;—the great inflammation, and large ſuppurations uſually conſequent on the wounds of the articulations;—the uncertainty of obtaining a firm Callus;—the loſs of the inſertions of the Extenſor Muſcles;—the doubt reſpecting the utility of the limb,

provided a cure could be obtained;—the uncertainty of removing the whole diſeaſe when Caries gave riſe to the operation;—and, when undertaken on account of ſcrophulous affections of the joints, the hazard of a return of the ſame diſeaſe.—Theſe difficulties, though they might appear at firſt ſight very weighty, would, I was in hopes, on more attentive conſideration, be found to loſe much of their force. The danger of wounding the principal veſſels in the arm was very trifling, their ſituation being ſufficiently remote from the bone to place them out of all hazard. In the knee there was much more room for apprehenſion on this ſcore, the Popliteal Veſſels paſſing ſo immediately between the Condyles of the Femur; I was however of opinion, that they might be avoided without much difficulty; but this was eaſily determined by experiment on the dead ſubject: with this view, therefore, as well as to determine the mode of operating, the following trials were made in the Spring of 1781.

An inciſion was made, beginning about two inches above the upper end of the Patella, and

continued about as far below its lower extremity; another, croſſing this at right angles, immediately above the Patella, the leg being in an extended ſtate, was made through the tendons of the Extenſor Muſcles down to the bone, and nearly half round the limb; the lower angles formed by theſe inciſions, were raiſed ſo as to lay bare the Capſular Ligament; the Patella was then taken out; the upper angles were raiſed, ſo as fairly to denude the head of the Femur, and to enable me to paſs a ſmall catlin acroſs the poſterior flat part of the bone immediately above the Condyles, taking care to keep one of the flat ſides of the point of the inſtrument quite cloſe to the bone all the way. The catlin being withdrawn, an elaſtic ſpatula was introduced in its place, to guard the ſoft parts, while the Femur was ſawed through: which done, the head of the bone thus ſeparated was carefully diſſected out; the head of the Tibia was then with eaſe turned out and ſawn off, and as much as poſſible of the capſular ligament diſſected away, leaving only the poſterior part covering the veſſels, which, on

examining, I had the ſatisfaction to find had not only eſcaped unhurt, but that it was not a very narrow eſcape; they had ſtill a pretty good covering, and had been through the whole operation far enough out of the courſe of the knife. It muſt be confeſſed, that the appearance of the wound was ſomewhat formidable, exhibiting a very large cavern, with very thin Parietes; and, in ſhort, there ſeemed little wanting to complete the amputation; yet, as the limb below would not be deprived of any part of its nouriſhment; and every healthy inciſed ſurface, as well of bone as of ſoft parts, has a natural tendency to granulate, I could not ſee any room to doubt that Nature would find ſufficient reſources to repair this breach.——The next attempt was on the joint of the elbow;—a ſimple, longitudinal inciſion was made from about two inches above, to the ſame diſtance below the point of the Olecranon; the integuments raiſed, and an attempt made to divide the lateral ligaments, and diſlocate the joint: but this being found difficult, the Olecranon was ſawn off, by which means

the joint became ſo much expoſed, as to be eaſily diſlocated without any tranſverſe inciſion; the lower extremity of the Os Humeri turned out and ſawn off, and afterwards the heads of the Radius and Ulna. This appeared a very eaſy operation, not conſidering that this was a joint without a diſcaſe, and in an emaciated ſubject, conſequently one in which there was a great laxity of integuments. In the diſeaſed joint, I apprehend, the caſe will be found far different, and that it will be neceſſary to make the crucial inciſion, and to divide the Humerus above the Tuberoſities, in the manner I have already deſcribed in the extirpation of the lower extremity of the Femur.

The next difficulty was the great inflammation, pain, and extenſive ſuppurations, uſually conſequent on wounds of large articulations; theſe appear to be, in a great meaſure, owing to the expoſure of the Capſular Ligament, a membrane, which, on the application of the ſlighteſt ſtimulus, is readily brought into a ſtate of inflammatory tenſion, and is then moſt exquiſitely ſenſible, and of a large cartilaginous

ſurface, extremely unfavourable for the production of granulation. But it muſt be conſidered, that by the operation in queſtion, this ligament and cartilage would be removed, and a freſh inciſed ſurface obtained: beſides, it is now well known that, on ſome occaſions, large articulations may be treated with conſiderable freedom, without producing ſuch dreadful conſequences; of this the removal of the head of the Os Humeri, as practiſed by Meſſrs WHITE, BENT, and ORRED, and the ſawing off the protruded extremities of bones in compound diſlocations, as recommended by GOOCH and others, though operations differing conſiderably from the one I am treating of, are ſufficient proofs. Why the ſymptoms conſequent on theſe operations have been ſo mild, I will not take upon me to determine, yet think it not improbable it may be owing not only to the free openings made for the diſcharge of matter, but, in a great meaſure, to the ſtate of relaxation in which the remaining portion of the capſular ligament was placed, by the removal of part of the bone forming the articulation. Now, that

I have had occaſion to mention compound diſlocations, it may not be thought out of place to relate a caſe of this kind, which fell under the care of Mr WAINMAN, of Shripton, in Craven, twenty-three years ago, who has the greater merit, as that mode of treating compound diſlocations was, at that time, but little practiſed. This caſe, which, in juſtice to Mr WAINMAN, as well as to mankind in general, ought to have been publiſhed long ſince, he deſcribes as "a recent luxation of the Cubitus "occaſioned by a fall from a horſe in full "ſpeed, which forced the Os Humeri through "the common integuments a conſiderable "length into the ground, and the bone was "quite denudated;" and adds, "there was not "a poſſibility of reducing it, and I thought it "moſt eligible to take off the limb, which the "family objected to. I called in Dr TAY-"LOR, who was of my opinion, but it would "not be complied with. We then judged it "beſt to ſaw off the Os Humeri, which I did "about an inch above the Sinus that receives "the Olecranon; I then placed the arm in

" ſuch a poſition as I thought would be moſt " advantageous, prognoſticating an Anchyloſis " would enſue, in which I was much miſtaken; " the perſon is now living, and can perform " all the motions of the joint, which is as flex- " ible as if nothing had ever been amiſs."—Mr WAINMAN, in another letter to my good friend Dr BINNS of this town, to whom I am indebted for the communication of the above, as I am to Mr WAINMAN for his permiſſion to inſert it here, deſcribes the Luxation more particularly, mentioning that the Os Humeri was diſlocated inwards, and that the heads of the Radius and Ulna were forced under the Biceps Muſcle.

The next objection was the doubt of obtaining a firm Callus: for this doubt I was in hopes there could be no reaſonable foundation, as we daily ſee that when two living ſurfaces of bare bone are oppoſed to each other, they have ever a tendency to unite; and as we ſee Nature ſo often effect this in theſe very articulations, under all the diſadvantages of a diſeaſed ſtate of parts, ſurely there could be lit-

tle reaſon to doubt that ſhe would do, at leaſt, as much when all diſeaſe was removed, and two perfectly healthy ſurfaces of bone were attempted to be united.

With reſpect to the loſs of the inſertions of the Extenſor Muſcles, it was ſufficient to reply, that the joint being extirpated, there was no longer any want of muſcles to move it; and that the inciſed ends of theſe muſcles, as there would not be any part of them taken away, muſt unavoidably attach themſelves to ſome part of the Callus; which was all that would be neceſſary.

The queſtion concerning the utility of the limb, provided a cure could be obtained, was, indeed, a very important one, and deſerved well to be conſidered. In the arm, however, the advantages ariſing from the preſervation of a hand and fingers, with all their original motions, except thoſe of pronation and ſupination, were ſo very evident, and ſo very conſiderable, independent of the motions of the elbow, or of any conſiderations reſpecting the length of the arm, as not to leave room for

a moment's hesitation, and were certainly sufficient to induce persons, in every station in life, to run many risques to obtain a cure on the terms I was proposing. In the leg, I own, I was less sanguine in my expectations of advantages equal to the hazard, and for the following reasons: The parts forming the Parietes of the Cavity, after the bone was removed, would be almost wholly tendinous or membranous; the opening would not be a depending one; the confinement to bed would be necessarily long; and the limb would probably lose much of its length: whereas in the elbow the bone is much smaller, in proportion to the whole of the limb, and is surrounded by a good deal of muscular flesh; the opening would be wholly depending, the confinement to bed but little, and the shortening of the limb a matter of no great importance. However, as these tendons and membranes would be placed in a state of considerable relaxation; as depending openings might be obtained if necessary; and as the confinement to bed would, probably, be no more than we often see pa-

tients ſupport very well in caſes of fracture, I did not ſee ſo much to fear even from theſe cauſes; and with reſpect to the loſs of ſubſtance of bone, I expected to regain ſome part of that by callus; as it is well known to every attentive practitioner, that there is, in many fractures, a period of time, between the going off of inflammatory tenſion and the formation of callus, in which the limb may, if neceſſary, on account of much loſs of bone, be kept in a ſtate of extenſion, without material inconvenience; beſides, on converſing with ſome perſons who had ſtiff knees from different cauſes, with the limbs of their natural length, I found that they laboured under ſome inconvenience for want of ſome degree of ſhortening; as they found themſelves obliged either to deſcribe a circle at every ſtep, to avoid ſtriking their foot againſt every pebble that came in their way, or to ſeek an advantage by always keeping the ſtiff limb on the ſide of the lower ground: hence it appeared that ſome degree of ſhortening of the limb would be of advantage to the patient (a circumſtance, in general, too

little attended to in the conſtruction of artificial limbs); but what this degree would be, proportioned to what would take place in conſequence of this operation, experience only could decide: could it, however, be kept within moderate bounds, I could then have no idea that a foot and toes performed ſo inſignificant a ſhare of the action of walking, independent of the flexion of the knee, as to leave a limb of this ſort of no more value than a wooden one; and, indeed, the perſons alluded to above with ſtiff knees, did certainly walk with a degree of firmneſs, ſecurity, and ſatisfaction, far ſuperior to what the wearer of the beſt artificial leg I have yet ſeen can boaſt of; at the ſame time, I was ready to confeſs, that an artificial leg was an infinitely better ſubſtitute for a natural one, than any invention which art has yet furniſhed could be in place of a hand and fingers, and, therefore, ſhould be more nice in the choice of caſes in which I ſhould recommend this operation in the knee than in the elbow, until farther experience ſhould en-

able me to diſtinguiſh more accurately in what caſes it would or would not be admiſſible.

With regard to the two laſt objections, they certainly operated with ſome, if not with an equal degree of force, againſt amputation; as in thoſe few caſes in which external marks were wanting to enable us to judge with tolerable accuracy of the extent of Caries, we were equally unable to know whether it might not extend beyond the part in which we ſhould amputate; and in thoſe habits, in which a ſcrophulous acrimony was ſo prevalent as to occaſion a return of the diſeaſe, it was altogether uncertain whether the next attack would be on this limb, on any other, or on any of the internal parts.

Upon the whole, I could not ſee any juſt cauſe to apprehend, that a perſon who had undergone an operation of this kind, would be in a leſs favourable ſtate than one with a compound fracture with equal loſs of bone, but in which the principal blood-veſſels had eſcaped unhurt. Sufficient openings were made for the diſcharge of Pus, &c. and the ends of

the bones were made ſmooth by the removal of every ragged point and ſplinter; circumſtances, under which I am happy to have it in my power to ſay, that a very conſiderable majority of thoſe who are admitted into our Infirmary terminate happily. I am very ſenſible that this is by no means the caſe in the London Hoſpitals. How far the air of an Hoſpital, in the midſt of ſo very large and populous a City, and the previous mode of living of the major part of thoſe who are admitted there under theſe injuries may ſufficiently account for this difference, I muſt leave others to determine; yet think myſelf authorized to ſay, that the bad ſucceſs to which I have been an eye witneſs in the treatment of injuries of this kind, which appeared in their nature by no means formidable, though under the care of gentlemen of the firſt rank and abilities in the profeſſion, has been ſuch, as to juſtify the removal of many ſuch fractures, as a practitioner in a country ſituation would not find much difficulty in curing; for which reaſon I ſhould heſitate much to undertake ſuch an operation as I am now

recommending on the knee, under ſuch diſadvantageous circumſtanees.

Such were the conſiderations which made me reſolve to put this operation in practice the firſt favourable opportunity; whieh I did not long wait for, as, at the time when the experiments related above were made on the dead ſubject I had under my eare in the Infirmary, HEETOR M'CAGHEN, a ſtrong, robuſt, Seoteh ſailor, aged thirty-three, was admitted for a diſeaſed knee of ten years ſtanding. The joint, though pretty conſiderably enlarged, was by no means ſo much ſo as is frequently met with in ſerophulous affections; yet the integuments were ſo tenſe, as to appear ineapable of yielding to farther diſtention; the contraction of the Flexor Muſcles was ſueh as to draw back the leg, ſo as to form a right angle with the thigh, in whieh poſition it was immoveably fixed. Apparently ſome degree of union of the bones had begun to take plaee; but this eould not yet be determined with certainty, as every attempt to communicate to the joint the ſmalleſt degree of motion, gave him the moſt excruciating pain.

Various means were uſed for his relief, and, amongſt others, bliſters in their fulleſt extent, without the ſmalleſt benefit; but, that I may not ſeem to ſay any thing to the diſcredit of a remedy in many caſes ſo valuable, let it be underſtood, that, in this caſe, their application came too late, as it was pretty evident that Suppuration and Caries had taken place before he was admitted into the Infirmary, though as yet there was not any opening obtained. This poor man's ſufferings, which had been ſome time great, were daily increaſing, and his health daily declining, in ſuch a degree, that he began to beg to have the limb taken off. This, however, I could not conſent to do, without firſt propoſing and explaining to him the extirpation of the joint, in order that he might have the chance of ſuch a cure, if he choſe to take it; although, for reaſons already explained, I rather wiſhed to make the firſt attempt of this kind on the elbow: beſides, what made this caſe rather more unfavourable, was, that it was of the ſcrophulous kind, and that the motions of the foot and toes were but imperfect;

yet as theſe parts, as well as the muſcles that move them, were evidently free from diſeaſe, I was in hopes this aroſe merely from the painful ſtate of the knee; and as the diſeaſe was evidently confined to the articulation, and the man was free from ſcrophulous affection in every other part, I did not heſitate to propoſe this operation, to which he aſſented without much heſitation, and it was accordingly done on the 2d of July 1781.

In the performance of it one circumſtance occurred, which I think neceſſary to mention particularly, as it led me, and conſequently might poſſibly lead others, into ſome difficulty; which is, that I wiſhed to avoid making the tranſverſe inciſion, thinking it would be in my power, by a ſimple longitudinal one, after the Patella was removed, to raiſe the integuments ſo as to divide the lateral and croſs ligaments, and readily diſlocate the joint, ſo as to be able to turn out the heads of the bones alternately, and ſaw off juſt as much as I might find diſeaſed; but in this I was greatly deceived, and found that I had not made ſufficient allowance

for the difference between a healthy and a diſeaſed ſtate of parts: in ſhort, there appeared ſuch confuſion of parts on opening the articulation, the ligaments being, in ſome parts, extremely thickened and horny, in others in a ſloughy, ſuppurated ſtate, with the Cartilages almoſt wholly deſtroyed, and the heads of the bones much eroded by the offenſive matter, of which there was a good deal in the joint; beſides, that ſome degree of bony union had already begun to take place between the head of the Tibia and the inner Condyle of the Femur; that, after ſpending ſome time in the attempt, and conſequently making the operation much more painful and tedious, it was thought adviſeable to relinquiſh this idea, and to make the tranſverſe inciſion, and divide the Femur above the Condyles, as has been already deſcribed, in giving an account of the mode of operating on the dead ſubject; in which I have likewiſe ſufficiently deſcribed the manner in which the head of the Femur, as well as that of the Tibia, were removed; it is, therefore, unneceſſary to repeat it here. The quantity of

bone removed was ſomewhat, though not much, more than two inches of the Femur, and of the Tibia rather more than one inch; which were but juſt enough to enable me to bring the leg into a right line with the thigh, the previous contraction of the Flexor Muſcles being ſuch as to keep the two ſawn ends of bone in cloſe contact. The only artery that was divided in the operation was one on the anterior part of the knee, which ceaſed to bleed before the operation was concluded, although the pulſation continued pretty ſtrong in the ankle; the ends of the bones, however, particularly that of the Femur, bled pretty freely. It will readily be conceived, that there remained a conſiderable redundance of integument; to ſupport this, ſo that it might not fall inwards between the ends of the bones, and to keep the edges of the inciſions in tolerable appoſition till they ſhould acquire ſome degree of firmneſs, a few ſtitches were paſſed through the ſkin, as well along the courſe of the tranſverſe inciſion, as of that part of the longitudinal one that extended up the thigh; the lighteſt ſuperficial dreſſings only

were applied, and the limb placed in a caſe of tin, ſufficiently long to receive the whole of it, from the ankle to the inſertion of the Glutæus Muſcle.

The man paſſed the day in a good deal of pain; had frequent vomitings, and loſt a good deal of blood; ſo that in the evening, about ſix o'clock, I found him very languid, with a low, weak pulſe, of about 120. On looſening the bandages, which were full of blood, and become very tight and uneaſy, I found that the hæmorrhage had nearly ceaſed, and the man became much eaſier; the cavity of the wound was filled with coagulated blood, with which the integuments were diſtended to a very conſiderable ſize: this I did not chooſe to remove, but contented myſelf with again dreſſing ſuperficially with wax and oil, laying over it compreſſes dipt in cold Aq. Saturn. which were ordered to be kept conſtantly wet; and an anodyne draught was given him.

July 3d.—Had paſſed a reſtleſs night, but without much pain, or any farther hæmorrhage; continued to have frequent ſickneſſes,

and the integuments ſtill continued much diſtended, but the leg and thigh remained free from ſwelling. Ordered to take the Saline Draughts in the effervefcing ſtate; for drink to have butter-milk and lemonade, and to repeat the anodyne in the evening.

4th.—Had paſſed an eaſy night, and ſlept a good deal; had ſtill ſome ſickneſs, but begun to have a deſire for a little ſolid food, which was allowed him; the coagulated blood beginning to diſſolve and come away, and the tenſion to abate. Ordered to continue the ſame medicines and applications, with the addition of compreſſes, dipt in brandy, laid under each ſide of the limb; and to have the pillows and bandages ſprinkled with Sp. Vin. Camph. to correct the fœtor.

5th.—Had not paſſed ſo good a night, complaining much of pain in the back, from poſture; had not any pain of conſequence in the limb; pulſe 120, but very little heat or thirſt; had no ſickneſs, except when he took the ſaline medicines, which were ordered to be diſcontinued. As he had not yet had a ſtool ſince

the operation, ordered to take Ol. Ricini ad Alvi Solution. and then to begin with Infuſ. Cortic. Peruv. and to repeat the anodyne in the evening. Removed the ſtitches from the inner tranſverſe inciſion, in hopes of giving a more free diſcharge, but without immediate effect, as union ſeemed, in a great meaſure, to have taken place; filled the cavity of the wound lightly with dry lint.

6th.—Had had two ſtools; no more ſickneſs; pulſe 112; had ſome pain the day before, in conſequence of the motion given to the limb in adjuſting the bandages, and in going to ſtool, but had paſſed a good night, and the limb very cool and eaſy; the ſwelling a good deal ſubſided; the lower end of the inner tranſverſe wound had opened a little, giving vent to ſome matter; the outer inciſion united, and the ſtitch removed; ordered to continue the bark and the anodyne.

7th.—The ſtitches above the knee ſeemed to be doing miſchief, by confining the integuments too much; the lower one was therefore removed, which gave a good deal of liberty; the

wound opening about an inch giving much eaſe; the ſore in general looked very foul and ſloughy, and the diſcharge very large and fœtid; in other reſpects as well as on the 6th. Ordered to change the infuſion of bark for the decoction.

9th.—The higher ſtitch on the thigh had torn out, and the wound had opened more largely, but looked cleaner, and the diſcharge in general was more moderate. Some uneaſineſs had been occaſioned by the matter being too much confined by the pledgets; it was therefore ordered, that, after the cavity was lightly filled with dry lint, a turnip poultiee be laid over it. This applieation I find in general leſs uneaſy than the carrots, and remarkably ſpeedy and powerful in correcting the fœtor of putrid ulcers, and therefore partieularly valuable in an hoſpital. I believe it would have been better had I removed all the ſtitches at the firſt or ſecond dreſſing, as their only uſe was to ſupport the lax integuments, until they ſhould acquire ſufficient firmneſs to prevent them from falling in between the ends of the

bones, which end was ſufficiently anſwered by the inflammatory thickening in twenty-four hours. I am likewiſe of opinion, that it would have been better, had I, at the time of the operation, filled the cavity lightly with dry lint, to have reſtrained the effuſion from the ends of the bone, and afterwards to have poſtponed dreſſing the wound as long as poſſible.

10th.—The ſore much ſweeter, and the diſcharge improved in quality, and diminiſhed in quantity; granulations beginning to ariſe from both ends of the bone; pulſe 108; belly regular. His bed becoming very uncomfortable, he was removed into a freſh one.

12th.—Had been a good deal diſturbed the two laſt nights with ſpaſms in the thigh; his general health, however, did not ſeem hurt by them, and the whole inner ſurface of the wound appeared granulated, and the bones nearly covered;—was ordered to increaſe his anodyne to 40 drops, and allowed a pint of ale per day.

14th.—Had paſſed two better nights, though the ſpaſms were ſtill troubleſome; had gotten

the limb into a bad poſition, in conſequence of turning too much on the ſide, the poſture in which he had been accuſtomed to ſleep for ſeveral years, but at preſent a very unfavourable one, as by this means the end of the Femur was raiſed too high, and caſt outwards: this was rectified, though not without ſome pain and trouble. It may be ſufficient to mention here, once for all, that this circumſtance gave me a good deal of trouble at different times during his whole confinement.

15th.—Had paſſed a good night, free from ſpaſms, without opiate; ordered to diſcontinue the poultices, and, in their ſtead, to have cloths dipt in a mixture of equal parts of lime-water and brandy, and a ſomewhat tighter bandage.

17th.—The diſcharge at each dreſſing not nearly half as much as on the 15th, though the wound, which had hitherto been dreſſed twice a day, was reduced to one dreſſing only.

21ſt.—The diſcharge no more than ſufficient to moiſten the dreſſings; the cavity in a great meaſure filled up, and the wound contracted to leſs than half its original ſize; the inner end

of the tranſverſe inciſion united, and nearly healed. The integuments, which, on the decline of the ſwelling, had been a good deal puckered on each ſide of the knee, had now adapted themſelves very much, though there was ſtill an overplus. Changed his bed again.

26th.—Complained that the bark diſagreed with him, and that he had two or three days vomited it up in the afternoon, and with it the greateſt part of the food he had taken; on which account it was diſcontinued: he had at that time a good deal of night-ſweats.

28th.—The ſickneſs gone off, and the ſweatings abated. There appeared a ſmall quantity of matter formed under the Cicatrix, on the inſide of the knee, and was making its way through a ſmall opening, into which a bit of ſponge was introduced.

31ſt.—An opening, about an inch in length, was obtained in the old Cicatrix, by means of the ſponge, and gave vent to about three ounces of pus.

Auguſt 2d.—The diſcharge from the laſt mentioned opening very trifling; the general

wound contracting very faſt; the granulations from the two ends of the bone in a great meaſure united; ſtill ſweated a good deal in the night. Ordered to take Elixir Vitriol. Acid. Gutt. xx. terquaterve de die.

4th.—A ſmall puſtule, not larger than a nut-kernel, which had been obſerved two or three days on the inſide of the leg, a little above the calf, in the place where he had formerly had an iſſue, but appeared too trifling to deſerve notice, burſt this day on taking off the dreſſings; and I was not a little ſurpriſed to find that it led into the cavity of an abſceſs, from which iſſued four or five ounces of pus, the principal lodgment of which was in the ham, where the ſkin ſeemed very thin; and I was in hopes a completely depending opening would ſoon be obtained. Two or three ſmall ſcales of bone, being exfoliations from the inner edge of the Femur, not larger than a ſixpence, came away this day.

7th.—The ſweatings much abated, and the diſcharge from this laſt opening very trifling.

9th.—Obſerved two other ſmall ſinuſſes, one

on the inside of the knee, the other on the anterior part, too trifling to deserve much notice. He had had, during the preceding night, a good deal of pain down the shin; the union, however, seemed to be gaining strength, as, on moving the foot from side to side, I observed that the motion was communicated in some degree to the thigh.

14th.—Still complained of pain down the shin, and on the outside of the leg; and, on examining, I observed near the head of the Fibula, a small lodgment of matter, which, on pressure, was discharged from the general wound; I therefore made a small opening in the most depending part, and passed a seton through.

18th.—Thinking the seton had sufficiently done its office, I removed it; and, finding a good deal of excoriation and pustular eruption on the thigh, changed the Aq. Calcis for Aq. Saturn. with brandy, of each equal parts.

21st.—The excoriation and eruption much diminished; still some little lodgment on the outside of the leg, but no pain; the union evidently gaining strength. Had his bed, splints,

&c. again changed, which he bore with much leſs pain than any of his former movings.

23d.—Finding the opening I had made on the outſide cloſing up, and the quantity of matter increaſing, introduced a freſh thread.

Sept. 1ſt.—Dilated a ſmall ſinus on the inſide of the knee; the anterior wound reduced to a very ſmall compaſs; the union become ſo ſtrong, that whatever rotatory motion was given to the leg, was communicated to the thigh, though the Callus was ſtill flexible.

8th.—Began to get out of bed, and to remain up a few hours every day; little or no diſcharge from the orifice in the calf of the leg, nor any ſenſible lodgment in the ham; his general health very good; the union become ſo ſtrong, that he could, by taking hold of the leg with one hand, raiſe the limb, and turn it as he pleaſed without pain, though the Callus was ſtill flexible; removed the ſeton.

15th.—No freſh collection where the ſeton had been, and the opening ſeemed to be healing up.

October 1ſt.—The wound on the outſide

completely healed; the cavity of the abſceſs in the ham pretty well conſolidated; the oriſice in the calf of the leg healed, and the anterior wound reduced to a very trifling excoriation of a very ſmall ſurface; a very ſmall diſcharge ſtill remaining from the inſide of the knee; the Callus not ſenſibly improved for the laſt three weeks.

20th.—Had a ſlight feveriſh attack, accompanied with a ſlight eryſipelatous inflammation on the knee, which ſhewed a diſpoſition to break out afreſh. As there was great reaſon to believe that this might be in a great meaſure owing to long confinement in an hoſpital, it was thought adviſeable to remove him into the country. Accommodations were therefore procured for him in a farm-houſe about three miles from town, to which he was removed on the 22d: the Cicatrix of the anterior wound nevertheleſs gave way, degenerating into a ſpreading ulcer, which, in a few days, extended to the ſize of a crown piece. He was put upon the uſe of the Cortex in ſubſtance, and had the ſore dreſſed with Tinct. Myrrh. cum Mell. Roſarum.

Nov. 4th.—His health again perfectly re-eſtabliſhed, and the ſore again become clean, and in a healthy ſtate; the Callus ſeeming to acquire firmneſs.

Dec. 1ſt.—The ſore reduced to a very ſmall compaſs, and the Callus ſenſibly improving; began to walk about on crutches.

15th.—The Callus become ſufficiently hard to enable him to raiſe the limb, with the aſſiſtance of a hand under the thigh, without taking hold of the leg at all, and without the union appearing to give way in the leaſt; though, upon forcible handling, it had ſtill an obſcure degree of flexibility.

31ſt.—Strong enough to raiſe the limb without the aſſiſtance of his hand.

Jan. 15, 1782.—The Callus no longer at all flexible.

30th.—A ſmall abſceſs opened on the inſide of the knee, but almoſt too trifling to be worth mentioning.

Feb. 28th.—All wounds perfectly healed, and his ſtrength daily improving.

March 23d.—I was alarmed by a meſſenger,

informing me that the man had fallen and broken his leg. This I had the ſatisfaction to find was in ſome degree a falſe alarm; he had however fallen, owing to the breaking of one of his crutches, and bruiſed the outſide of his knee very much. This accident was followed by a good deal of pain, pretty high inflammation, and a large abſceſs, which burſt in about a fortnight; and, when the pain and foreneſs were gone off, ſo that he could bear to have the limb handled with ſome degree of force, I found that the Callus was again become ſomewhat flexible; nor did it recover its ſolidity before the middle of June, during the greateſt part of which time, the orifice, by which this abſceſs diſcharged itſelf, continued to ouze, though in a very trifling quantity. After this dried up, all the ſores remained perfectly well. He now began to make every day more uſe of the limb; but, as it muſt be expected that muſcles, which had been ſo very long out of action, and a limb that had ſuffered ſo great a waſte, muſt be very weak, it was not before the end of July that they acquired ſufficient firmneſs to

ſupport the weight of his body. He then complained that his foot and toes, though he had recovered the perfect motion of them, were yet ſo weak, that it was with difficulty that he could ſupport his whole weight on them, and begged to have a high-heeled ſhoe; he was therefore allowed one with a heel an inch and a half higher than the one he wore on the other foot; with this he was able to walk with great eaſe and firmneſs, without even the aſſiſtance of a ſtick, or of any kind of ſplint to ſupport the union. He continued, nevertheleſs, when out of doors, to make uſe of a crutch and ſtick, which, however, I expect he will ſoon lay aſide: and, on his going to work, he was furniſhed with a caſe of thin cow's leather, made to lace from the ankle to the upper part of the thigh, ſtrengthened by a piece of thin plate-iron up the outſide, to guard him from injury. The limb was at this time nearly three inches ſhorter than the other; the knee very ſlightly bowed outwards, owing to the difficulty of keeping him in a good poſition, which I have already mentioned, though not in

ſuch a degree as to occaſion any deformity, but what might very readily paſs unnoticed by an inattentive obſerver. The redundant integuments form a ſmall plait on each ſide of the knee; the muſcles, as may naturally be expected, are yet ſmaller than in the other leg and thigh; and the foot, by an exact meaſure, taken by the ſhoemaker who made his high-heeled ſhoe, three quarters of an inch ſhorter than the other. It will appear, by this account, that but a very ſmall part of the length loſt by removal of bone, was in this caſe regained by Callus; but let it be remembered, that I have already remarked, that the previous contraction of the flexor muſcles was ſuch, as to make it impoſſible it ſhould be otherwiſe, although I made ſome attempts, during the cure, to increaſe the length, by placing the limb in a ſtate of moderate extenſion*.

Whoever barely conſiders the length of time from the performance of the above operation,

* Since the above was written, he has laid aſide his crutch, has gotten a ſtrong uſeful limb, free from pain or ſwelling, and is gone to ſea.

to the completion of the cure, will perhaps think the proceſs more tedious and troubleſome than the event can compenſate. On this account, perhaps it may not be amiſs to recapitulate the following circumſtances, viz: That the operation was done on the 2d of July; that the firſt ſymptoms were by no means ſevere; that the diſcharge, which for ſome days was very conſiderable, as muſt be expected from ſo large a ſurface of wound, was much diminiſhed by the 10th; and by the 21ſt was no more than ſufficient to moiſten the dreſſings; and that by this time the cavity of the wound was in a great meaſure filled up, and the ends of the bones covered by granulations: That of the ſubſequent collections of matter, only two were of any importance; nor were theſe ſuch as to occaſion the ſmalleſt apprehenſion of danger, or material difficulty: it was pretty evident that they were occaſioned by the portion of diſeaſed capſular ligament, which was unavoidably left in the poſterior part; and probably they might have been prevented by a depending opening, which might have been

made at the time of the operation, and perhaps effectually maintained, by introducing a seton into either extremity of the transverse wound, and bringing it out at the ham, taking care to avoid the vessels: That the confinement to bed was between nine and ten weeks; which, as well as the time which the Callus took in forming, was not longer than many compound fractures require, in which it is nevertheless pretty clear that the event must be favourable. On the whole, from what I now see of this man's limb, I do not hesitate to declare, that it appears to me so much more valuable than any artificial one, that, was I in his situation, I should infinitely prefer the former, at the price which he has obtained it: nor shall I hesitate to repeat and recommend the same attempt to others under similar circumstances. At the same time, I must leave every Surgeon at liberty to determine for himself what he would recommend to his patient; and every unhappy sufferer to fix his own value on his own limbs, and on the time and pains which it may be

likely to coſt him, either to preſerve or part with them.

Whatever objections, however, may be made to the operation I have been deſcribing on the knee, I apprehend few will refuſe to ſubſcribe to the utility of a ſimilar one in affections of the articulation of the elbow. Though here, perhaps, it may be objected, that I am recommending an operation, which I have not yet performed on the living ſubject. I grant it; yet think myſelf authoriſed to do ſo, by the ſucceſs of the attempt on a joint, in which I have ſufficiently ſhewn, that the undertaking is attended with much greater difficulties and hazard; and by the event of the following caſe, which fell under the care of my worthy friend and colleague Mr Alanson, already ſufficiently known to the chirurgical world, by his excellent Obſervations on Amputation; and which will be allowed to be much to my preſent purpoſe, as it was a caſe in which the ſame end was in ſome meaſure obtained, though by Nature alone, without the aid of inſtruments.

Elizabeth Malcomb, a woman upwards of

fifty years of age, was admitted into the Infirmary on the 15th of March 1781, for an extenſive Gangrene in the Arm, occaſioned by a fall on the point of her elbow: the Gangrene deſtroyed the greateſt part of the Extenſor Muſcles, and integuments on the back part of the arm, laying the Os Humeri bare, nearly as high as the ſhoulder, and laid the joint of the elbow largely open; yet, as the Capſular Ligament was wholly deſtroyed, the ſubſequent ſymptoms were by no means urgent. In a few weeks the Olecranon exfoliated, as did likewiſe the inner tuberoſity of the Humerus, with a ſcale about ſix inches long, one in breadth, and about as thick as a ſhilling, from the back part of that bone: the joint was ſoon filled by granulations, and healed over; a firm Callus obtained, and the woman was diſcharged with a ſtiff elbow on the 19th of July following, having only a very ſmall ſuperficial ſore unhealed in the upper part of the arm, for which ſhe did not think proper to remain longer in the hoſpital, as her health was rather in a declining ſtate. It can hardly be neceſſary to point out,

that this patient's fore-arm was kept in a ſtate of flexion; nor that this is the poſition I ſhould recommend after the extirpation of the elbow, as this is a practice which has long been ſufficiently eſtabliſhed in the treatment of every injury and diſeaſe of that joint, in which the recovery of perfect motion is at all doubtful. But whether this ſhould in all caſes be ſuch as to make the fore-arm form a right angle with the Humerus, or whether ſometimes a more or leſs acute one; and whether the poſition of the hand ſhould in every caſe be an exact middle ſtate, beween the extremes of Pronation and Supination; are points which can only be determined with accuracy, by conſidering the occupation in life of each individual patient. This ELIZABETH MALCOMB, as will be ſeen by the dates, was in the Infirmary at the ſame time with HECTOR M'CAGHEN; and her cure was drawing toward a concluſion when his knee was taken out, and gave me no ſmall encouragement to undertake that operation.

After all, I beg I may not be ſo far miſun-

derſtood, as to have it ſuppoſed that I am ſanguine enough to imagine, that the method I have been recommending will certainly ſucceed in every caſe. I know the contrary, and fear that, after the Chirurgic Art has done all that it is capable of, many of theſe diſeaſes will ſtill occur, in which Amputation alone can preſerve the life of the patient. Of theſe I have met with three caſes within the few laſt months: two were knee caſes, in which the diſeaſe of the ſoft parts was too extenſive to encourage the attempt; and the third an elbow caſe, in which, not only the extent of caries was too great and uncertain, but the muſcles moving the hand and fingers were ſo cemented together, as to have left theſe parts altogether uſeleſs, could they have been preſerved. I have, nevertheleſs, reaſon to believe, that, even in theſe caſes, extirpation might have ſucceeded at a more early period of the diſeaſe; but the misfortune is, that perſons labouring under diſeaſed joints, are but ſeldom willing to ſubmit to any great operation, until their lives are brought into imminent danger; in which ſtate,

SECOND CASE

OF

MR PARK,

As communicated by him in a Letter to Dr SIMMONS, 5th November 1789, and published in the 11th volume of the London Medical Journal.

IN the year 1783, I ventured to obtrude on the world a small Pamphlet, pointing out a mode of treating some of the affections of the large articulations, which I then believed had not been attempted by any other practitioner.

To the history of the case of HECTOR MCAGHEN, there related, I have now to add, that he afterwards made several voyages to sea; in which he was able to go aloft with considerable agility, and to perform all the duties of a

ſeaman: that he was twice ſhipwrecked, and ſuffered great hardſhips, without feeling any farther complaint in that limb; but was at laſt unfortunately drowned, by the overſetting of a flat in the river Merſey.

As the propriety, however, of adopting ſuch a practice can only be determined by a number of experiments, I feel myſelf equally bound to communicate to the Public the event of my ſecond attempt of this nature, although it proved as unfortunate as the firſt was ſucceſsful.

The ſubject of this operation was CHARLES HARRISON, aged thirty years, by trade a wheelwright, and to appearance a ſtrong, robuſt man; but who was, as I afterwards learned, of a highly ſcrophulous family.

His knee, which had been diſeaſed about three years, was more enlarged than that of HECTOR M'CAGHEN; the diſeaſe in the ſoft parts was more extenſive; and a conſiderable abſceſs had formed, which extended ſome inches below the joint, on the outſide of the leg, but had not yet opened.

The operation was performed agreeably to

the patient's choice, on the 22d of June, with little variation, as to the *modus operandi*, from the former one, except that an opening was firſt made into the abſceſs, as well to anſwer the purpoſe of a depending drain afterwards, as to afford an opportunity of examining the ſtate of the fibula, which was not found diſeaſed.

Two ſmall arteries were taken up, and the cavity lighty filled with lint. An anodyne was given immediately after the operation; notwithſtanding which, he paſſed the day in a good deal of pain; but, by repeating the opiate in the evening, had an eaſy night.

The wound was not opened till the 27th, when only the bandages and external dreſſings, which were becoming offenſive, were changed, and he was removed into a freſh bed. The knee appeared large, but the leg and thigh were pretty free from tenſion; the diſcharge was moderate in quantity, and good in quality, coming moſtly from the depending opening; and the man ſeemed very well in his general health.

The dreſſings did not all come out till July the 1ſt, when the whole ſurface of the wound looked clean, and the granulations were ſo luxuriant, that the ends of the bones were covered, and the cavity was in a great meaſure filled up.

July 8th.—The diſcharge was much diminiſhed, very little coming from the depending opening.

—— 20th.—Some degree of union appeared to have taken place; the bulk of the knee, and the ſurface of the wound, were diminiſhing apace. Some pus, however, was preſſed out of the granulations, as from a ſponge.

—— 24th.—He had a diarrhœa during the two laſt days. A ſmall quantity of pus had made its way through the cicatrix of an old iſſue below the inſide of the knee, but no more could be preſſed out of the granulations. The union appeared to be gaining ſtrength.

—— 31ſt.—He had gotten the limb into a bad poſition; the wound was a good deal looſened, and there was rather more diſcharge; the bulk of the limb, and ſurface of the wound,

were diminiſhing faſt; the diarrhœa had ceaſed, but he had night-ſweats, looked ill, felt languid, and complained of a good deal of pain in the other leg, which was ſwollen and œdematous.

Auguſt 10th.—The affection of the other leg was much abated.

——— 21ſt.—The ſweats had ceaſed, and his ſtrength was much improved. The diſcharge was ſmall, and the union was apparently ſtronger than it had yet been. We now began to take him out of bed frequently.

——— 26th.—He complained of more pain, ſwelling, and ſoreneſs. The union appeared more looſe, and the diſcharge more conſiderable; but he ſeemed to be in tolerably good general health. About this time I learnt that his family were highly ſcrophulous.

September 7th.—The diſcharge was ſtill conſiderable. He had been languid, and had but little appetite during the two laſt days; but ſeemed better to-day.

——— 14th.—The diſcharge was again become moderate, with appearance of more

union; and the healing of the wound was advancing.

September 30th.—He had a troubleſome diarrhœa.

October 3d.—He had inceſſant bilious vomiting and purging, with ſevere griping, great internal heat, and troubleſome aphthæ. By theſe complaints, he was ſuddenly brought into ſuch a ſtate, as to preclude every idea of removing the limb, could we have had ever ſo much reaſon to hope that, by ſo doing, we ſhould have removed the whole diſeaſe. In this ſtate he continued until the 13th, and then ſunk, in ſpite of all our efforts.

Soon after the publication of my little pamphlet, the late Mr FILKIN, of Northwich, informed Dr BINNS, of this town, that he had performed a ſimilar operation, about twenty years before, with ſucceſs. The Doctor, at my requeſt, applied to Mr FILKIN for the particulars of the caſe, but was diſappointed in his attempts to obtain them; that gentleman being ſoon after ſeized with a paralytic affection, which greatly impaired his faculties, and

at laſt terminated in his death. I have been, however, ſince favoured with a letter from his ſon, at preſent ſurgeon in Northwich; of which the following is an extract:

" You will, I fear, think me very remiſs in " not anſwering your kind favour long before; " but as my father's notes do not deſcribe the " caſe of the operation of the knee ſo plainly " as I could wiſh, I have waited till an oppor- " tunity occurred, when I could ſee the man, " to have what he knew on the matter; and " though all I can collect on the ſubject is ve- " ry trifling, ſtill I beg leave to ſend you what " little information I have gained.

" The patient was always of a ſcrophulous " habit, and had for many years a tumour on " the knee, which gradually increaſed in ſize, " and to which every topical application was " uſed without effect. By accident, falling " from a horſe, the patella was fractured, and, " from a ſmall wound, there was diſcharged " about half a pound of fœtid, foul-coloured " pus. Amputation was immediately propoſed; " but the parents not conſenting, my father

" was called in. Having frequently thought " this method might ſometimes ſucceed, and " having performed it once on the dead body, " he propoſed it to the parents of the patient " in this caſe, though it was an unfavourable " one, the patient's general health being much " impaired. The parents conſenting, a day " was fixed for the operation, which was per- " formed on the 23d of Auguſt 1762. The " ligaments were found in a very ſloughy, " ſuppurative ſtate, with the cartilages greatly " injured, and the heads of the bones much " diſeaſed, particularly the head of the tibia. " The patella, with the head of the femur, and " a portion of the tibia, were removed; a good " digeſtion came on; the limb was kept in a " ſtraight poſition; and on the 21ſt of Novem- " ber 1762, he was got ſo well as to require " no farther attention.

" I am extremely ſorry I cannot give you a " more particular deſcription of this caſe; and " regret much, that my father in his health did " not inform either you, or our worthy friend, " Dr BINNS, minutely of it. The perſon is

" now living, and ſometimes goes to Liverpool,
" where, if you will give me leave, I will de-
" ſire him to call upon you."

A letter from Mr TYRE, of Glouceſter, has the following paragraph, which he has obligingly given me his permiſſion to inſert here:

" Four or five years ago, I aſſiſted the late
" Mr JUSTAMOND in removing the olecranon,
" and two inches of the ulna, continued from
" that proceſs, in a man who had a diſeaſed
" elbow joint; and I have lately met with a
" boy, in whom an accident ſeparated the os
" humeri from its connection with the bones of
" the fore-arm, and forced it, denuded of its
" perioſteum, through the integuments; I
" ſawed off two inches and a half of its length,
" including the condyles. Both theſe caſes
" were completely ſucceſsful."

In a ſubſequent letter from Mr TYRE, in anſwer to my requeſt, that he would favour me with farther particulars of the former of theſe caſes, he ſays, " The patient, a man, had a ca-
" ries in the ſuperior extremity of the ulna; it
" was not purely ſcrophulous, nor were the li-

" gaments ſo much thickened or diſeaſed as we " commonly find them, when a white ſwelling " has ſuppurated and ulcerated: the olecranon, " and two inches of the ulna, continued from " it, were removed. To render the ſeparating " the ulna from its connection with the os hu- " meri more eaſy, a portion of the olecranon " was firſt chiſeled off; the ulna, cleared from " the ſoft parts, was then ſawed through; the " articular ſurface of the os humeri was not " taken off or ſcraped away; the radius was as " little meddled with as poſſible; nor was " there more of the capſular ligament extirpat- " ed, than what neceſſarily came away with the " portion of ulna: ſo that here the elbow joint " was not removed, but only the extremity of " one of the bones of which it is compounded. " The man recovered without the leaſt unto- " ward ſymptom, and had a very uſeful arm: " the motions of flexion and extenſion, as you " may ſuppoſe, were almoſt loſt, but he retain- " ed the power of rotating the hand."

The account given of my little pamphlet, in the London Medical Journal, concludes with

ſaying, that, ſince its publication, the operation had been repeated with ſucceſs, in the elbow, by an ingenious and enterpriſing ſurgeon of one of the London hoſpitals.—*Query.* Is not this the caſe I have juſt quoted of Mr JUSTAMOND*? Be that as it may; though Mr JUSTAMOND's operation be not a complete extirpation of the joint, it is certainly one of not leſs merit, leſs difficult execution, or leſs happy in its conſequences.

* Mr Park is right in his conjecture: it was to the operation performed by Mr Juſtamond that we alluded. See Medical Journal, Vol. IV. page 282.—EDITOR.

Liverpool, November 5, 1789.

SUBSEQUENT OBSERVATIONS

BY

MR PARK.

LIVERPOOL, 10th Sept. 1805.

THE foregoing little work, of which a ſecond impreſſion is now offered to the Public, was firſt publiſhed in 1782; but, I am mortified to ſay, that it has to this day produced very little, indeed, of the effect it was intended to produce. The oppoſition it met with, and the failure of my ſecond operation of the ſame kind, ſo totally defeated my views, that I have not yet learned, that it has, hitherto, proved the means of ſaving a ſingle limb in the whole of the Britiſh dominions: and, ſince its publication, this country has paſſed through a long

and bloody war, without this practice being at all adopted, or ſcarcely known either in the Army or Navy of Britain. In this ſtate of neglect, and indeed oblivion, would my attempt, in all probability, for ever have remained, had not the late Mr MOREAU, an enterprising French Surgeon, taken up the ſubject, and carried his experiments farther than I ever ventured to attempt. It appears, by the ſtatement of his ſon, that this gentleman and I entertained ſimilar ideas, nearly at the ſame time, without either of us knowing of the other's intentions. The ſon's publication on the ſubject has lately fallen into my hands; in which I find ſome criticiſms on my mode of operating: to which I have only to reply, that, it will be obſerved, that I have already acknowledged, that I by no means conſidered my method of operating as perfect, and that I left it to be improved by thoſe, who might have more frequent opportunities of performing the operation. And, I now add, that I leave every Surgeon to chuſe, which of the two modes he may find moſt ſuitable to his

own ideas, and to the circumſtances of each particular caſe. The handſome manner in which Mr MOREAU is pleaſed to ſpeak of my late publication, in different parts of his work, demands my public acknowledgments. I only lament that his work did not appear a dozen years ſooner: however, as we are now but juſt entering upon the ſerious part of another war, I hope it is yet in time to do infinite good, by preſerving a great number of limbs, if the knowledge of it can be generally diffuſed through the army and navy. When Mr MOREAU's work fell into my hands, Dr JEFFRAY was accidentally in Liverpool, where he firſt ſaw it, and thought the ſubject of ſufficient importance, to induce him to take the trouble of tranſlating it for the benefit of his Students. This tranſlation he has conſented to publiſh; and politely propoſed that an impreſſion of my pamphlet ſhould accompany it, in order that they, who read Mr MOREAU's obſervations upon it, may, at the ſame time, ſee the work on which theſe remarks were made.

To this propoſal I readily acceded, in hopes that more attention will be paid to the ſubject now, than it has hitherto received. When I ſpeak of diffuſing the knowledge of this ſubject through the army and navy, I feel myſelf juſtified in uſing this language, by having been aſſured by gentlemen of the profeſſion, who had ſeen much ſervice during the late war, that the only idea then entertained, reſpecting wounds of the large articulations, was, that ſuch limbs were to be conſidered as fit objects for amputation.

I was in hopes that this idea had long ſince loſt much of its weight, from the ſucceſs that has attended the practice, that many have adopted, of ſawing off the protruded heads of bones in compound diſlocations; from Mr JUSTAMOND's removing the ſuperior extremity of the ulna, in a caſe of caries; and from the ſtill more enterpriſing attempt of Meſſrs WHITE and BENT, in taking off the ſuperior extremity of the os humeri, long before I made my attempt on the knee, and propoſed the ſame in the elbow. I truſt, however, that Mr MOREAU's ſucceſs will

give ſuch encouragement to attempts of this nature, as will be productive of infinite benefit to mankind. His ſucceſs will, I hope, prove ſufficient, in ſome degree, to counterbalance the unfortunate termination of my ſecond attempt on the knee—an account of which is given in the preſent publication: but without that counterbalance, I ſhould hope, that a failure in a diſeaſed joint, ariſing from a conſtitutional cauſe, in an unhealthy ſubject, of a highly ſcrophulous family, would not be conſidered as ſufficient to prohibit a ſimilar attempt on an articulation, ſuffering from an external injury, in a healthy ſubject. Much leſs ſhould a failure in the knee diſcourage the attempt in the elbow; in which I have already ſhewn, that the operation was more eaſily practicable, the attempt much leſs hazardous, and the end to be obtained infinitely more valuable; if theſe facts were not too obvious to common ſenſe, to require any explanation at all.

To the ſolicitude I have expreſſed, to introduce this practice into the army and navy, it

has been objected, that the accommodations, in these situations, are not always such as to admit of such attempts; and that the hurry of an action may often oblige a Surgeon to have recourse to the most expeditious method of saving his patient.

These objections I admit, to a certain degree. I allow, that the excision of the knee may be wholly inadmissible in ships, as the necessary state of quietude can hardly be obtained there, for a sufficient length of time, to accomplish a cure; and, perhaps, similar difficulties may occur in military hospitals, belonging to an army in action. But I cannot admit, that these difficultics can operate to such a degree, as wholly to prohibit the attempt in the articulation of the elbow. In the first place, I cannot conceive, that any circumstances, except profuse hœmorrhage, can render any operation so immediately necessary, as not to admit of the delay of a few hours; and this hœmorrhage may, indeed, arise from such injury to the principal vessels, as may preclude every attempt to save the limb. And here I beg leave to observe, that,

when the principal veſſels of a limb are ſo much injured, as to render it doubtful whether the life of that limb can be preſerved, Surgeons may carry their fears of making the experiment, from the apprehenſion of a fatal gangrene, to too great a length; for I am inclined to believe, that it is not, in every caſe, neceſſary to delay the amputation of a limb, in which a gangrene has commenced, till a ſeparation has taken place, or even till the gangrene be ſtopt; provided it is clear, that the gangrene ariſes ſolely from a cauſe, ſo entirely mechanical, as the privation of the nouriſhment, by the accidental deſtruction of the arteries from which it derives its ſupport: at leaſt, I have met with one deciſive proof to the contrary. In a caſe of popliteal aneuriſm, before any operation was performed, a gangrene took place; but ſtopt before it had made ſo much havoc, as to render it certain that the limb could not be rendered uſeful, provided the aneuriſm could be cured: the operation, therefore, was done, and was ſoon ſucceeded by a freſh gangrene, which was ſpreading rapidly, when I took off the limb, and the

patient recovered without difficulty. I therefore venture to ſtart the queſtion, Whether, in ſimilar caſes, the patient may not have a better chance for recovery, from the removal of the limb, as ſoon as it becomes certain that its life cannot be preſerved (provided the amputation be performed, at leaſt above the part in which the veſſels are injured), than from waiting till a more accumulated maſs of dead matter ſhall have exerted its deleterious effects on the ſyſtem in general? But to return from this digreſſion, I would aſk, What an army or a navy Surgeon would do, if a man was ſhot through the middle of the os humeri, or bones of the fore-arm, without material injury to the large veſſels, and without any very extenſive comminution of bone, or laceration of muſcles? I hope he would not, in ſuch a caſe, be ſo ſtrongly impreſſed by the fatal conſequences that await the attempts to cure compound fractures in the London Hoſpitals, though under the management of, perhaps, the firſt Surgeons on the ſurface of the globe, as to think of amputating the limb; eſpecially when the eaſe, with which very ſevere injuries of this

kind recover under the care of Surgeons of very inferior abilities, but placed under more favourable circumſtances, not only in country ſituations, but even in County Infirmaries, is univerſally known. I truſt he would attempt a cure, by removing all ſplinters; by ſawing off the inequalities of the fractured extremities of the bones; by applying eaſy dreſſings; and ſecuring the limb in a quieſcent ſtate, by ſuitable ſplints and bandages. Where, then, can be any greater difficulty, or will more time be required in accompliſhing the ſame end, when the injury is in the articulation, than when it is in the middle of either humerus or cubit? Or why ſhould we apprehend more danger in the one caſe than in the other, now that Mr MOREAU has adduced three caſes, in which the ends of both bones were removed—Mr JUSTAMOND one, in which the upper extremity of the ulna—and Mr WAINMAN one, in which the lower end of the os humeri, was taken off?——To theſe I may here be allowed to add one more, in which the ſame end was obtained, as in Mr WAINMAN's caſe, though with a good deal more difficulty.

A young gentleman, of the name of WARDELL, about 14 or 15 years of age, fell into the hold of a veſſel, and received a very ſevere injury in the arm. The os humeri was broken, very near the elbow; the fractured extremity was forced through the wound, immediately above the inner tuberoſity; the point of the olecranon was likewiſe broken off; I dilated the wound, ſawed off the extremity of the protruded bone, and removed the portion of the olecranon, which was detached from the ulna: by theſe means, I gained room to introduce my finger into the wound, to examine the ſtate of the joint, which I found was laid open; the ligaments were torn off from the head of the bone, about half way acroſs the joint; but remained firmly attached to it on the oppoſite ſide, towards the tuberoſity. After ſome deliberation, it was judged much more likely, that the broken off part of the bone would remain a dead maſs, and prove ſuch a ſource of irritation, as would defeat every intention of cure; than that it would unite to the ſawn extremity by callus: it was therefore decided to remove it. This proved a tedious and

troubleſome operation; yet was effected by means of a curved probe-pointed biſtoury, conducted by the point of the finger; and the wound was cloſed by ſticking plaiſter. The cure of this injury was interrupted by one or two abſceſſes; but not ſuch as excited the ſmalleſt apprehenſion for the ſafety of either life or limb; and he now enjoys conſiderable ſtrength of the arm, with every motion, very nearly perfect.

A Sketch of the Bones accompanies this: the pieces of bones themſelves are in the poſſeſſion of Dr WARDELL, Inſpector of Military Hoſpitals, the young gentleman's uncle.

Having ſpoken of ſawing off the protruded ends of bones in compound diſlocations, I take this opportunity of expreſſing a degree of concern, to find this practice not ſo univerſal as I once thought it was. A gentleman, now eſtabliſhed in Liverpool, but who received his education at a conſiderable Infirmary in the Weſt of England, aſſures me, it was till lately, if it does not ſtill continue to be, their pretty conſtant practice, to amputate compound diſloca-

tions. And a young gentleman, a native of a town in the North of England, where there is a very conſiderable Infirmary, attended by Surgeons of deſerved eminence, was under my care, for an injury of this kind. On his return to his friends, after his cure, he found the Surgeons there agreeably ſurpriſed with the ſucceſs of his caſe; ſaying, that they had only made that experiment once in their Infirmary; that it failed then, and they had not repeated the attempt.

A ſhort account of this gentleman's caſe may not be improper here. He was thrown out of a gig, at full ſpeed; by which accident, the ankle was diſlocated, and the lower extremity of the tibia forced through a tranſverſe wound, about four inches long, ſo as to protrude very conſiderably. This protruded part was ſawn off, about an inch and half in length, and the edges of the wound brought together by a few ſtitches; the limb laid in a relaxed poſition; the air excluded; and as neither pain nor diſcharge, except the hœmorrhage of the firſt day, made it neceſſary to expoſe the wound, it was not uncovered till the end of the third week; when it was

found perfectly united by the firſt intention; become a mere ſuperficial ſcratch, which ſoon cicatrized completely; and not a drop of matter was ever perceived to be diſcharged from, or collected in the joint. It will readily be conceived, that the ſoft parts would remain, for ſome time, in a thickened, ædematous ſtate, and the joint very little moveable. In a reaſonable time, however, motion began to be recovered, and every action of the joint is now as perfect as in the other ankle; and ſuch a degree of ſtrength does he enjoy (although the limb is ſhortened in a degree nearly equal to the bone removed), that he is able to walk a whole day in taking the diverſion of ſhooting, and to dance whole evenings without inconvenience.

I have ſeen ſome compound diſlocations, under the care of Surgeons in ſmall towns, in the neighbourhood of Liverpool, forcibly reduced, without taking off the ends of the bones. In theſe, the ſubſequent ſymptoms were abundantly more troubleſome; but even theſe got well, without removing the limbs.

It has been the invariable practice at the Liverpool Infirmary, for more than thirty years, to take off the protruded extremities of bones, in cafes of compound diflocations, and, I believe I may fay, with invariable fuccefs.

END OF

MR PARK'S COMMUNICATIONS.

CASES

OF THE

EXCISION

OF

CARIOUS JOINTS.

BY P. F. MOREAU,

De Bar-ſur-Ornain, M. D. de l'Ecole de Paris.

Il eſt rare que l'on arrive tout-à-coup à l'évidence: dans toutes les ſciences et dans tous les arts, on a commencé par une eſpèce de tâtonnement.

Log. de Condillac, chap. ix.

TO THE MEMORY

OF

MY FATHER,

AND TO

A. M. PERCY,

PROFESSOR IN THE COLLEGE OF MEDICINE AT PARIS,

INSPECTOR GENERAL OF HOSPITALS, &c.

P. F. MOREAU.

INTRODUCTION.

IN writing this diſſertation, I have ſtudied to make it a practical work; I have avoided ſpeaking of Caries, in a general and ſcholaſtic way; I have confined myſelf, entirely, to one ſingle point, on which, I hope, I can throw light. Therefore, whatever my opinion, reſpecting definitions, and general principles, cauſes, diagnoſtics, prognoſtics, &c. may, in other reſpects, be, the reader need not expect to meet with any thing concerning them here.

I confeſs, that if, in order to make what, in this little work, I have to ſtate, be the more eaſily underſtood, I did conſider myſelf under any neceſſity of ſaying what Caries is, I would be

very careful not to compare it to ulceration in ſoft parts; for, independent of the error, that muſt be, in any compariſon between parts which differ ſo widely from one another, in organization as well as function, the particular characters of the two diſeaſes are materially different from one another. Beſides, every deſcription of a ſenſible object, to be juſt, ought to be a picture of its moſt ſtriking features.

I doubt, whether thoſe, who have been practically engaged in the treatment of caries, have been able to derive any advantage from this diviſion of the diſeaſe into the dry, the moiſt, &c. But, young though I be, I have been already able to ſee, that this claſſification is of little value; for, inſtead of pointing out any real differences between diſtinct and ſeparate ſpecies, it preſents, in moſt caſes, nothing more than different ſtages of the ſame diſeaſe. The late Dr Monro* has made a diviſion of caries, that is ſtill more extraordinary. He ſpeaks of the dry or gangrenous caries; the

* Medical Eſſays, Edin. vol. v.

worm-eaten caries, or ulceration of the bone; the carnous caries, with ſpongy granulations; the phagedenic caries, with unhealthy granulations; and different kinds of caries, that are ſymptomatic. I quote no other authors. Theſe are ſufficient to ſhew, that, on this point, medical men by no means agree. We need not be ſurpriſed at this, for none of their claſſifications reſt on the baſis of accurate obſervation. I attempt no diviſions. It will be ſufficient, if I ſtate diſtinctly the characters of the diſeaſes, of which I propoſe to give ſome account.

The treatment of caries, ſituated in the body of a bone, has, long ago, been greatly improved. It is well known, that TROJA, TRIOEN, DAVID, WIEDMAN, and other able ſurgeons in Paris, were acquainted with other reſources, than thoſe of that timid practice, which contents itſelf with topical applications; and, which is worſe, expects, from time, a cure, which it dares not attempt itſelf. My father left me ſome intereſting caſes on this ſubject; which, at a future period, I ſhall turn to uſe. But, as they are not immediately connected

with the ſubject of this diſſertation, I cannot give them a place here.

The ſpirit of obſervation had raiſed ſurgery ſo high, during the laſt age, that it is ſurpriſing we have not been more familiarized with bold ideas. Men, even of enlightened underſtandings, are ſo apt to found their opinions on analogy, and on what they have been accuſtomed to, that unexpected diſcoveries will always meet with oppoſition, till repeated experience enforce conviction. The method, which I have to propoſe, for the cure of caries in ſeveral joints, is, as yet, ſo little known, that, with all the experience I have had, I ſhould be afraid to mention it, if I could not bring forward witneſſes, whoſe teſtimony will have the greateſt weight.

In the year 1784, Mr PARK's obſervations on cutting out the articulating ends of the bones of the elbow and knee joints, were tranſlated and publiſhed in France, by the celebrated Profeſſor LASSUS; whoſe authority, one would have thought, might have procured for them a favourable reception. They were received with

aſtoniſhment; and ſo far were they from gaining credit, that, even ſo late as 1789, they had acquired ſo ſmall a number of partiſans in the academy of ſurgery, that ſome caſes of a ſimilar kind, which were preſented to the academy by my father, were rejected; though they were of ſuch a nature, and ſtated in a way that might have deſerved a more favourable reception.

He had long felt the inefficacy of the means, uſually employed, for the cure of caries; and being accuſtomed to deviate from the uſual routine of practice, he had, on the 13th of Auguſt 1782, cut out a caries of conſiderable extent, from the lower end of the leg bones of a man, called Lecheppe. The ſucceſs of this operation was ſo complete, that, in drawing the concluſions, to which he thought it naturally led, he expreſſed himſelf in the memoir, which he preſented to the academy next year, in the following terms.

" Caries in joints is accounted an incurable " diſeaſe, requiring amputation. In caſes, " where every other method of cure has been

" tried in vain, might we not attempt to ſave " the limb by an operation, ſomewhat like am- " putation?"

He takes, as an example, the elbow joint, and goes on thus.

" Although the caries ſhould have affected " the whole of the joint, yet, even in ſuch a " caſe, I would not heſitate to cut it out. I " would bring the cut ends of the bones toge- " ther; and while the contraction of the muſ- " cles would retain them in contact, I would " keep the limb fixed, as in caſes of fracture, " and wait patiently, till nature ſhould unite " the ends of the bones together by callus."

Farther on, he adds.

" Surely, there are many other circumſtan- " ces, which ſhould determine us, in the treat- " ment of ſevere complaints of the joints, to " deviate from ordinary practice."

That the value of theſe quotations may be fully underſtood, it ſhould be ſtated, that the above mentioned memoir was written in the year 1782: and, I believe, I do not riſk much, when I ſay, that the diſcovery was from that

moment made; and that my father waited only for an opportunity, to carry the ideas he entertained into execution. The work of Mr PARK could not have been conſulted, for it did not appear in France till the year 1784. Without wiſhing to take away from the author of that work, the tribute of gratitude which is his due, it may be obſerved, that, beſides the difference betwen Mr PARK's method of operating, and that of my father, Mr PARK inſpires fear, rather than confidence; as is manifeſt, from the effect which his book produced on thoſe who might have followed his example; among whom may be reckoned, his judicious countryman BENJAMIN BELL, who, in ſpeaking on the ſubject, expreſſes himſelf thus*: "Although the merits of the operation muſt be "determined by farther trials, yet the riſk attending it appears to be ſo great, that there "is much reaſon to ſuſpect that it will never "be generally practiſed."

The reflections which ſuggeſted themſelves to my father, from the ſucceſsful caſe of LE-

* Bell's Surgery, vol. vi. p. 130, edit. 3d.

CHEPPE, determined him to remove the head of an os humeri, and the correſponding glenoid cavity, which were carious. This operation, which was performed at Couſance in 1786, in preſence of M. BALTHAZARD, an able ſurgeon of that place, was followed with complete ſucceſs; and, in the ſame year, an account of it was communicated to the academy of ſurgery, by whom it was favourably received; but, like the former, it was not publiſhed, and, in all probability, it remains among the unedited papers of that ſociety.

In 1789, my father addreſſed to the ſame ſociety, a memoir, the object of which was, to explain his new method of removing caries; and to point out the inefficacy, and the danger of the methods, uſually practiſed. This eſſay, though ſupported by many facts, met with the moſt violent oppoſition. They found it more convenient to deny, than to examine the facts, on which it was grounded; and, inſtead of taking any trouble to aſcertain their reality, they anſwered in a way that forbade all future inquiry, upon a ſubject, which deſerved the

greateſt attention. This, however, could not diſcourage my father; nor did it ſtop him in a career, in which none of his cotemporaries ſeemed to have the courage to follow him.

The operation, which is the ſubject of the 4th Caſe in my book, and is one of Caries of the Knee, was performed in 1792, when the army of KELLERMANN paſſed through Bar-ſur-Ornain, in their march to the camp at La Lune; and as Meſſrs PERCY and CHAMERLAT, ſurgeons general to the army, and many other ſurgeons of the firſt rank, were preſent, and aſſiſted, it is not poſſible to ſuppoſe that the operation was not really performed.

This caſe demonſtrated, more than ever, to M. PERCY, the poſſibility of ſuch operations; which he had, indeed, performed already, in ſeveral caſes of caries; and to which, ſince that time, he has had recourſe, with ſo much ſucceſs, in caſes of Gun-ſhot Wounds in the joints, eſpecially thoſe of the ſhoulder and elbow.

M. SOMMEILLIER, a pupil of my father, and a well-informed ſurgeon, in that part of the country where I live, has likewiſe accompliſhed

ſurpriſing cures, by this method of management, which is too little practiſed.

I ought to mention, in this eſſay, the experiments of M. CHAUSSIER, who cut out the articulating ends of the bones, from the different joints of various animals.

M. PELLETAN, the eminent ſurgeon in the Hotel-Dieu, who, even in 1789, had his doubts reſpecting my father's caſes, will here, I am perſuaded, allow me to mention the encouragement which he gave me to publiſh this work.

The exciſion of the head of the os humeri is ſomewhat better known, than the operation I am going to deſcribe. Some Engliſh ſurgeons, ſince WHITE, have given examples of it. M. PERCY, who had performed it twice, previous to 1789, and with the moſt complete ſucceſs, has, ſince that time, performed it in the army frequently, in caſes of gun-ſhot wounds; in which, according to the rules of ordinary ſurgery, amputation muſt have been performed: and many of his colleagues have, by the ſame practice, ſaved the limbs, and perhaps the lives, of many of the wounded.

My father, as I have ſaid, addreſſed his memoir to the academy, in 1786. M. PELLETAN ſeems to have been the only one, of all the members of the academy, who, ſince that time, has ever mentioned the ſubject *. And, as his opinion was different from that of the reſt of the members of the academy, I have judged it right to publiſh the caſe, which has, indeed, led the way to the operations, of which I now propoſe to give an account.

* Cours de Clinique externe, à l'Hotel-Dieu.

CASES

OF THE

EXCISION

OF

CARIOUS JOINTS.

CHAP. I.

ELBOW JOINT.

BEFORE I ſtate the caſe, which I intend to bring forward, in proof of the neceſſity and utility of cutting out the Elbow Joint, when affected with Caries, I think it proper to conſider, what the preſent ſtate of ſurgery, on this point, is. And here I cannot have many authors to conſult; for, it is not long ſince this ſubject has become an object of attention; and the operations, which have been performed, have been ſo troubleſome, that ſurgeons have been afraid to attempt them.

Mr PARK is the only individual, of whom I need ſpeak. He conceived the poſſibility of cutting out the carious extremities of the bones of the elbow joint; but he gives no inſtance, in which he had actually carried this idea into execution. He only tried the operation on the dead ſubject; and of that trial he gives the following account.

"A ſimple longitudinal inciſion was made, "from about two inches above, to the ſame "diſtance below the point of the olecranon; "the integuments raiſed, and an attempt made "to divide the lateral ligaments, and diſlocate "the joint: but this being found difficult, the "olecranon was ſawn off; by which means "the joint became ſo much expoſed, as to be "eaſily diſlocated, without any tranſverſe in-"ciſion; the lower extremity of the os humeri "turned out, and ſawn off, and afterwards "the heads of the radius and ulna. This ap-"peared a very eaſy operation, not conſider-"ing that this was a joint without diſeaſe, "and in an emaciated ſubject, conſequently "one in which there was a great laxity of in-

" teguments. In the diſeaſed joint, I appre-
" hend, the caſe will be found far different;
" and that it will be neceſſary to make the
" crucial inciſion, and to divide the humerus
" above the tuberoſities, in the manner I have
" already deſcribed, in the extirpation of the
" lower extremity of the femur."

Mr PARK obſerves, and very juſtly, that to operate on the dead ſubject, and to operate on the living body, are two things, between which, no compariſon can be made. In fact, the diſeaſe produces ſuch a change in the appearance and condition of the parts, that our operation cannot, in the two caſes, be the ſame. For when caries takes place in a joint, the fleſh, which ſurrounds the joint, becomes ſwollen; and the ulcers, which follow, produce an alteration in the tiſſue of the ſoft parts, to a greater or leſs degree.

Till the bone be laid bare, the ſurgeon cannot ſay, how much of it he ſhall be obliged to remove. The duration of the diſeaſe is a criterion, on which we cannot rely; for, recent caſes of caries, either from the cauſes by which

they were produced, or the ſtructure of the bone affected, or the manner in which the diſeaſe has been treated, are, ſometimes, more extenſive than others of long ſtanding. The ſwelling of the ſoft parts is a ſymptom, that is as deceitful; for it is always conſiderable, when a joint is affected with caries. The probe can give intimation, reſpecting the ſtate of thoſe parts, only, which it touches; and as it cannot be made to paſs, but where the fiſtulous openings directly lead, it frequently happens, that the caries can be diſcovered only at at ſome ſingle point, while yet the whole body of the bone may be diſeaſed. The ſuppuration, the pain, inability to move the joint, &c. can give us as little information, on which we can depend.

It is, therefore, abſolutely neceſſary, in performing the operation, that we have it in our power to ſtop, or to go on a little farther, according as the extent of the caries may be. It will be ſeen, in Caſe III. that my father made only one flap, becauſe he found nothing which required to be taken away, beyond what, in

making that flap, he had laid bare. The method of operating, which Mr PARK recommends, does not admit of this reſource; for, his longitudinal inciſion being inſufficient, on account of the ſwelling of the ſoft parts, it becomes neceſſary to make another acroſs, which produces four flaps. This multiplicity of flaps does not appear to me to be dangerous; but it is totally unneceſſary; for we can come at our end, as well with two: and, I can aſſure the operator, that he will find himſelf much more embarraſſed by four flaps, than by two. The direction, about removing the olecranon, if it be not carious, is at leaſt uſeleſs; and, in general, it will not be found to be the moſt ready way of diſlocating the humeral bone.

Mr PARK relates a remarkable caſe, from Mr WAINMAN, which ſeems to be ſtrongly in favour of his ideas. This was "A recent luxa-
"tion of the cubitus, occaſioned by a fall from
"a horſe, at full ſpeed, which forced the os
"humeri through the common integuments, a
"conſiderable length into the ground, and the
"bone was quite denudated.—There was not a

" poſſibility of reducing it, and I thought it " moſt eligible to take off the limb, which the " family objected to. I called in Dr TAYLOR, " who was of my opinion, but it would not be " complied with. We then judged it beſt to " ſaw off the os humeri, which I did, about an " inch above the ſinus which receives the ole- " cranon. I then placed the arm in ſuch a po- " ſition, as I thought would be moſt advantage- " ous, prognoſticating an anchyloſis would en- " ſue, in which I was much miſtaken: the per- " ſon is now living, and can perform all the " motions of the joint, which is as flexible as if " nothing had ever been amiſs *."

This caſe, which would be very important, were we conſidering the treatment of compli- cated diſlocations, does not apply to the diſeaſe which I am conſidering here; becauſe the joint and the fleſh had undergone no change, by pre- vious and long continued diſeaſe; becauſe it does not hold forth a method of practice, which, in caries, can be followed, &c. It ſhould be

* The os humeri was diſlocated inwards, and the heads of the radius and ulna were forced under the biceps muſcle.

conſidered, that it is a more difficult thing, to lay bare, and cut out a carious joint, than it is to ſaw off the extremities of bones, accidentally diſlocated, and brought naturally, if I may ſo ſpeak, into view. In ſuch a caſe, the ſurgeon acts as the accident directs; and no general method of practice can be laid down.

I know of nothing elſe, that has been publiſhed, on this operation. Many late authors have ſpoken of it; but they have contented themſelves with mentioning briefly the directions of Mr PARK.

My father has, then, been forced to create his own method; and boldly to deſtroy a joint, which, before his time, no man dared to touch.

The operations, which I now am about to deſcribe, will, doubtleſs, be repeated. Let thoſe, therefore, who attempt to perform them, in caſes of extenſive caries, take care, that they have all their ſelf-command about them; for this kind of ſurgery requires caution, but it forbids fear. It has become, as I have ſtated, familiar to ſeveral eminent ſurgeons in the ar-

my of the Rhine, whom their chief, equally daring as enlightened, perſuaded, in caſes of ſevere gun-ſhot wounds of the joints, to give it the preference to that procraſtinating ſurgery, the ſource of uncertainty, of accidental miſhaps, and of fatal riſks; as well as to that deſtructive routine of ordinary practice, that cuts off a limb, as it were by ſtorm, which, by an operation, wiſely bold, might have been ſaved.

CASE I.

James Colignon, ſon of Widow Colignon, innkeeper at Voie, in the Arrondiſſement of Commercy, and Department of the Meuſe, was attacked, in the 19th year of his age, with a ſwelling of the left Axillary [maxillaire] Gland; which terminated, at laſt, in ſuppuration. Soon after the wound was healed, the joint became ædematous. Emollient cataplaſms, of various kinds, were applied, for the ſpace of ſix weeks; when an abſceſs formed on the inner condyle of the os humeri. This abſceſs was followed by others; till, after ſeven or eight months had been ſpent,

in fruitleſs medical management, he was left with two fiſtulous ulcers on the inſide, and a third on the outſide of the elbow. They communicated with the joint; the bones of which were felt, by the probe, to be bare. The matter diſcharged was a reddiſh ſerous fluid. When the joint was moved, the bones rubbed againſt one another, and a grating noiſe was diſtinctly heard. The ſkin, around the ulcers, was livid. The fleſh was ſwollen and ædematous, all round the joint. In other reſpects, the young man was in tolerable health.

Things were in this ſituation, when I was conſulted, on the 26th of June 1797.

The caſe was one, in which, perhaps, there was reaſon to ſuſpect ſcrophula; but, the caſes in which my father was concerned had ſhewn me, that the fear of ſcrophula is frequently chimerical, and ought not to be yielded to, except the exiſtence of ſcrophula be rendered probable, by the preſence of other ſymptoms. On this account, I determined to perform the operation, and in the following manner, without preparing the patient, in any other way, than by forbid-

ding him to eat any thing on the night before.

A table, about four feet high, was placed oppoſite to a light window. On this a bed was ſpread, on which the patient was ſo placed, upon his belly, that the diſeaſed arm lay on the edge of the table, preſenting to the operator, the poſterior and inner ſide of the joint.

This poſition required, that the patient ſhould be fixed in a way that is apt to excite fear; but when it is conſidered, that the ſurgeon is at his eaſe, while the patient is to undergo a painful operation, and muſt be retained in his place, ſo that the arm may lie fair to the operator, it will be ſeen, that I could not diſpenſe with this precaution.

After having applied the tournequet, on the upper part of the arm, to guard againſt the unneceſſary loſs of blood, as well as to deaden the ſenſibility of the parts to be operated upon, I entruſted it to an intelligent aſſiſtant. The arm being in a ſtate of ſemiflexion, I plunged a diſſecting ſcalpel * in upon the ſharp edge, or

* I prefer this inſtrument to the jointed biſtoury, on account of its firmneſs.

ſpine of the inner condyle, of the os humeri, about two inches above its tuberoſity; and, directed by the ſpine, I carried the inciſion down to the joint. I did the ſame on the other ſide. I then laid the two wounds into one, by a tranſverſe inciſion, which cut through the ſkin and the tendon of the triceps extenſor cubiti, immediately above the olecranon.

By theſe means, I got a rectangular flap, one end of which adhered to the fleſh, on the poſterior ſide of the arm. This flap I raiſed from the bone, diſſecting it, from below upward; and I cauſed an aſſiſtant to hold it up, out of the way.

The poſterior ſurface of the os humeri being now bare, I waſhed it, and wiped it with a ſpunge, in order to ſatisfy myſelf reſpecting the condition it was in. It was enlarged, and rough; the joint was filled with purulent matter, and contained a fungous ſubſtance that occupied the place of the cartilages, which had entirely diſappeared. No doubt remained, reſpecting the propriety of removing this part; but, wiſhing to be certain whether the caries

had penetrated into the whole of its ſubſtance, I pared a little of it away, with a gouge. This trial fixed my reſolution. I then ſeparated the fleſh which adhered to the anterior ſide of the bone, above the condyles, taking the precaution to guide the point of my inſtrument, with the fore-finger of my left hand; and, after I could paſs the handle of a ſcalpel through between the fleſh and the bone, I allowed the ſcalpel to remain there, and ſawed the bone through upon it. I finiſhed the removal of the piece, by raiſing and detaching it from all its adheſions. Perceiving that the bone was diſeaſed, higher up, I was obliged to take away ſix or eight lines more *.

The moſt difficult part of the operation yet remained; for, I had to remove the upper ends of both the bones of the fore-arm.

My firſt flap being no longer ſufficient, it became neceſſary to make another. I extended the lateral inciſion, at the outer ſide of the arm, carrying it downwards, along the external border of the upper part of the radius. I ſeparated

* See the pieces that were taken away, Plate I.

Fig. 6.

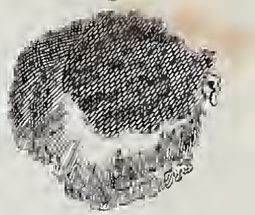


Fig. 7.

Fig. 5.

Fig. 4.

Fig. 3.

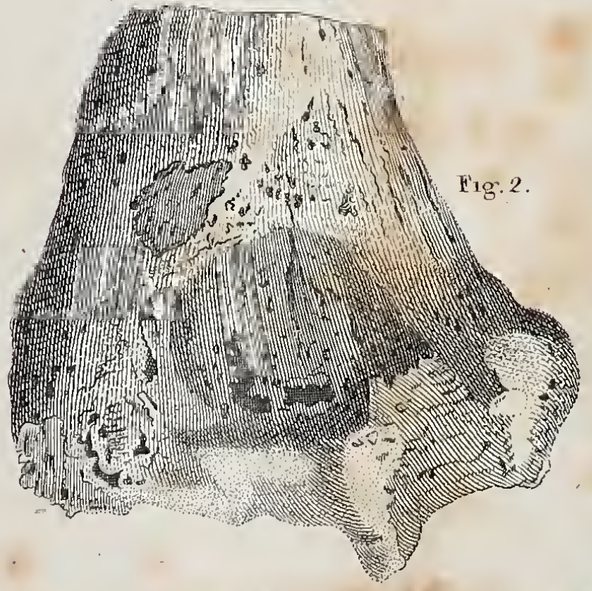


Fig. 2.

Fig. 8.

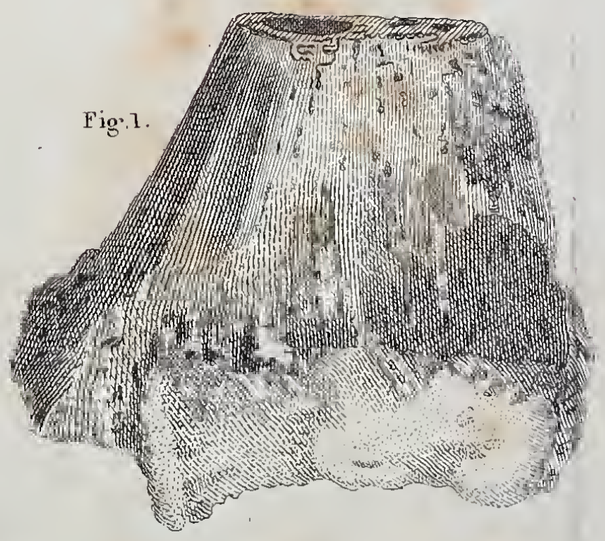


Fig. 1.

B.Lisars sculp.

the head of the radius from the ſurrounding parts; I deſtroyed its connection with the ulna; and I introduced a ſtrap of linen between them, to draw back the fleſh from being injured by the ſaw. I cut the radius acroſs, cloſe by the attachment of the biceps, which I had the good fortune to preſerve. Finding that ſome medullary cells, filled with pus, remained, I removed them with the gouge, without injuring the ſolid bone, by which they were ſurrounded *.

I next laid the ulna bare, by continuing the lateral inciſion of the inner ſide of the arm; which, with that I had made, gave me a rectangular flap, that adhered, by its baſe, to the fleſh on the back part of the fore-arm. I detached it from that part of the bone, which I wiſhed to remove. I ſeparated the bone from every thing that adhered to it; and having put a ſtrap of linen around it, to protect the fleſh, I ſawed off

* The bones of the fere-arm muſt be cut with a ſmall ſaw. The fleſh comes too much in the way of a large ſaw. The ſmall one is difficult to manage; but what better can we do? And, when you add to this, the riſk of cutting the veſſels, which, at this place, paſs through the interoſſeous ligament, you will ſee how difficult this operation muſt be.

about an inch and a half of the bone, meaſuring from the tip of the olecranon downwards. The reſt of the bone being ſound, a few medullary cells excepted, I took them away, in the ſame manner as I had done thoſe of the radius.

It may eaſily be conceived, that the wound, produced by this operation, was enormous. It will be ſeen, however, by the ſequel, that it healed as ſoon as if it had been only a common wound. It was waſhed; the tournequet was ſlackened; two or three ſmall veſſels ſprang, which I ſecured by ligature. I brought the two flaps together, and ſecured them by two ſtitches of the interrupted ſuture. I put in two more, into each of the longitudinal wounds; one into the flap of the arm, and another into that of the fore-arm, on each ſide *. That done, my patient was carried to bed; where a

* It may be thought, that the ſtitches would increaſe the contractility of the flaps, and be torn out. Without entering into the queſtion of ſutures, which, doubtleſs, is not yet decided; I have to obſerve, that, in caſes of this kind, the fleſh is not ſo irritable as in ſimple wounds, where the texture of the parts is not changed. And I can declare, that it is impoſſible to do without them, as any perſon will find, who attempts the operation.

cuſhion of chaff, covered with ſeveral folds of cloth, and an eighteen-tailed bandage, were placed. On this the arm was laid, in a half-bent poſture; and I covered the wounds with pledgets, dipped in a mixture of olive oil and yolks of eggs, in order to prevent the caddis from adhering, which renders the firſt dreſſing ſo painful. Over theſe pledgets, caddis was laid; and the whole was ſecured by compreſſes and a bandage. The weight of the bed-clothes was borne up by a hoop.

The firſt day paſſed, calmly enough. In the evening, the pulſe roſe; an anodyne was given, and barley-water with milk was allowed for drink. The night was paſſed without ſleep, though without pain; but the thirſt was great.

Next day, there was ſome fever; the ſkin, however, was natural. The dreſſings having become wet, with bloody and thin fœtid matter, I reſolved to remove them. The lips of the wound were beginning to inflame; ſimilar dreſſings were applied. The night between the ſecond and third day was good, with a little ſleep.

On the third day there was fever, but, in other reſpects, the patient was eaſy. In the morning, the dreſſings were wet as before; they were removed, and the wound was dreſſed as on the two preceding days. During the night between the third and fourth day, the patient ſlept five hours, though nothing but barley-water with milk had been given.

During the night between the fourth and fifth day, a ſlight hœmorrhagy took place, and the inflammation had increaſed.

On the fifth day, the thin matter diſcharged was copious and fœtid, and the wound was florid.

On the ſixth day, the matter diſcharged was whitiſh.

The ſeventh was better than all the former days. The inflammation had ſubſided; the matter diſcharged was good; the pulſe was natural, and the appetite and ſleep as good as could be wiſhed.

From this detail, it appears, that on the ſeventh day, this wound, which, from its ſize, might have made any one, not accuſtomed to

ſuch operations, afraid of ſome dangerous event, was nothing more than a ſimple wound, diſcharging good pus. This will not be ſurpriſing, if we keep out of view every idea reſpecting a wounded joint; and contemplate nothing, in this caſe, but a diviſion of ſoft and hard parts, the cure of which, as in amputation, goes on with a rapidity that is aſtoniſhing.

From the ſeventh to the fourteenth day, things went on better and better. Nothing unfavourable occurred, during this long period; the diſcharge decreaſed; the fleſh began to granulate; the tranſverſe wound healed; the longitudinal wound on the inner ſide, except about an inch at its lower end, was healed alſo. The cure of the external longitudinal wound was not quite ſo far advanced. It had a communication with the centre of the ſore, by a ſhallow ſinus. No pieces of bone, nor any ſcales, at leaſt none that could be ſeen, were diſcharged.

The patient wanted to get out of bed, which I permitted. He was put into an arm chair; and the arm was placed, as it had been in bed, by means of a little table made on purpoſe. In

fifteen days, he found himself so stout, that I had a case made for him, like that described by BELL, for fractures of the cavicle. In this I placed the arm, and he could go where he pleased.

Things continuing to do well, all the wounds being cicatrized, except at a few points, where the old cicatrix had opened again, I sent the young man home, carrying his arm in the case-sling, which, however, in a short time, he laid aside.

At first, this arm was powerless; but, by degrees, it gained strength. I did not see the lad for a long time; and I cannot describe the progress of his recovery, which, it need not be doubted, was slow.

In the year 1801, I had an opportunity of examining this arm. Its external appearance was like the drawing in Plate II. which is a representation of the outer side of the arm. Its length, measured from the acromion, along the outer side, to the extremity of the thumb, compared with the length of the other arm, is less

by three inches. The arm is alſo ſomewhat leſs than the other, in thickneſs.

The bones of the fore-arm, and what remains of the humerus, are at ſome diſtance from one another. When the arm is bent, this interval is not ſo great; but, even in that poſition, the bones are not in contact. The upper ends of the bones of the fore-arm have grown together. The biceps muſcle has been ſpared; but its belly is thickened, which has been occaſioned by ſhortening. The head of the ſupinator longus is entire. The back of the hand has evidently waſted; the little finger has no feeling; (the cubital nerve was cut in the operation;) the reſt of the fingers move freely, at pleaſure.

The flexion of the fore-arm upon the arm is ſtrong, firm, and ſteady. It is produced by the combined action of the biceps, and a conſiderable number of the fibres of the brachieus internus, the inſertion of which has been preſerved. The contraction of theſe two muſcles is very evident, during this action. It was a long time before this movement was regained. When he wanted to bend the arm, the fore-arm

ſhook, and fell in towards the inner ſide; but he has got the better of that of late, and now this motion is free and correct.

The extenſion is neither ſo free nor ſo firm, nor to the ſame extent. It ſeems to be produced by the action of ſome of the fibres of the triceps extenſor; the body of which, however, is very much waſted, which has occaſioned a hollow at the inferior and poſterior part of the arm.

The pronation and ſupination are not what they were. He can perform them; but the bones of the fore-arm, having grown together at the upper end, both turn at the ſame time. The fleſh, which fills up the ſpace between the bones of the arm and fore-arm, yields, as it were, by twiſting. The motion is extenſive. It cannot, certainly, be occaſioned by the pronators, becauſe the radius adheres to the ulna. What, then, can the muſcular force, by which this motion is produced, be?

I muſt not forget to ſtate, that this man has now the uſe of his arm, ſo completely, that he

uſes it in thraſhing in the barn, holding the plough, &c.

If theſe things ſeem to be incredible, they may be eaſily brought to the teſt of experiment. I am firmly of opinion, that, in ſimilar circumſtances, the iſſue will be the ſame. I have only to add, that the man is ſtill alive; ſo are all the patients, the hiſtory of whoſe caſes follow. So are many others, on whom the operation has been performed, in the army, either in the preſence of M. Percy, or by himſelf; in which operations, the reſults have varied, in proportion to the degree of injury done by the ſhot. I am authoriſed here to ſay, that this able ſurgeon avows, with grateful pleaſure, that it was my father, who was one of his beſt friends, that inſpired him with that happy boldneſs, which, it is true, he had previouſly ſhewn, in cutting out the head of the os humeri, but which, but for my father, he would not, perhaps, have ventured to carry ſo far, as to attempt the removal of the elbow joint.

CASE II.

A man of the name of MORIOT, a Chaſſeur in the 1ſt company of the Centre Legion, was diſmiſſed from the military hoſpital of Bar-ſur-Ornain, upon the 29th of Auguſt 1794. There were ſeveral ulcers near the elbow of his right arm, which were the conſequences of a gun-ſhot wound.

This ſoldier had undergone many operations, in different hoſpitals, without any relief. The arm was very much ſwelled, and ſo very painful, that he ſcarcely could allow it to be touched. The matter diſcharged was ſanious, and ſtained the dreſſings. He ſeemed, every day, to be getting worſe and worſe.

My father, having ſatisfied himſelf that a caries did exiſt, reſolved on the operation, which he performed in the following way.

Having ſeated the patient on a chair, and cauſed his arm to be ſupported by aſſiſtants, he made two longitudinal inciſions, one on each ſide of the arm, along the ſpinous edges of the os humeri. Theſe inciſions were begun, about

two inches and a half above the condyles; and were continued downwards, till they reached below the condyles, penetrating to the bone. He then made a third inciſion, above the olecranon. This inciſion, paſſing directly acroſs, from the one lateral inciſion to the other, produced a ſquare flap, which he raiſed from the bone, and made be held up by an aſſiſtant. He cut the ligaments of the joint; and, diſlocating the os humeri, he detached it from its muſcular adheſions, for about an inch downwards; and at that place he cut it through, becauſe it was completely carious. The reſt of the bone being found, he contented himſelf with removing, by the chiſſel, a few ſpots that were carious on its poſterior ſurface.

He next proceeded to make a new flap, in order to lay bare the upper end of the bones of the fore-arm, which alſo were carious; and, to effect this, he made one inciſion along the external edge of the radius, and another along the internal edge of the ulna, each about an inch in length, and in the direction of the longitudinal inciſions formerly made, beginning where

theſe ended. Having thus got another flap, he ſeparated it from the bones, which were found to be much diſeaſed. Having detached the bones from their adheſions, he cut off, from each of them, about an inch with the ſaw.

The patient was put to bed. His arm, half bent, was laid on a cuſhion, on which an eighteen-tailed bandage had been previouſly placed.

My father intended to have brought the flaps together by ſuture, but the following circumſtance put that out of his power. The patient, in the hope of rendering himſelf leſs ſenſible of pain, had drank a whole bottle of white champaign before the operation. As the man was not drunk, my father imputed the ſingularity of his manner to fear. But, upon the firſt inciſion, the blood iſſued in ſuch profuſion, that they were obliged to tighten the tournequet. This did not ſtop the bleeding; ſo that it was judged proper to fill the wound with caddis, gently crammed in. By this means, the bleeding was checked at laſt, but the lips of the wound could not be brought together.

In a few minutes after the dreſſings had been

applied, the patient fell into convulſions, and became delirious. The novelty of theſe ſymptoms made my father ſuſpect the cauſe.

On the third day, all the caddis was removed. The flaps had become retracted, inflamed, and ſo painful, that it was impoſſible to attempt ſutures. A trial was made with ſtraps, ſo diſpoſed, as to have in ſome degree the effect of the uniting bandage. For twenty days, theſe did very little good; but, after that time, they aſſiſted conſiderably in bringing the flaps together; the tumefaction of which began gradually to ſubſide; granulation took place, and the wound cicatrized. But this was not accompliſhed in leſs than ſix months, nor without a great deal of trouble.

Seven months after the operation, this patient was ſent home, completely cured. The arm, fore-arm, and the hand, were perfectly ſound. About two years after he left the hoſpital, he made his appearance at Bar. The cure remained complete, and the flexion of the fore-arm on the arm was very diſtinct.

CASE III.

A ſergeant, of the name of MARQUOISE, in the 3d battalion of the Meuſe, was ſent to the military hoſpital at Bar-ſur-Ornain, for an ulcer upon the external condyle of the os humeri of the right arm, the effect of a gun-ſhot wound.

My father, having aſcertained that the bone was carious, perſuaded the man to ſubmit to an operation.

After placing him, as he had done the other patient, he made a longitudinal inciſion, from the inferior part of the external condyle upward, for about two inches. From the inferior end of this inciſion, he carried another acroſs, which cut nearly the external half of the tendon of the triceps. He thus got a flap that was triangular, which he raiſed from the bone; and having brought the whole of the caries into view, he removed, by the gouge, the external condyle; a plate of about four inches in thickneſs and an inch in length, from the hard ſubſtance of the bone; together with part of the olecranon, with the bullet ſticking in it.

The flap was laid down, and fecured by two ftitches.

In fix weeks, the patient was perfectly cured, without any unpleafant occurrence. Three months thereafter, he joined his regiment, in which he continued to do duty for feveral years. At prefent, he is living at home, where he works at his trade as a fhoemaker; and the only remain of his former complaint, of which he is fenfible, is a difficulty of extending his arm completely.

My father cut out feveral other elbow joints; among which may be mentioned, that of Madamoifelle CELLIER at Bar-fur-Ornain, and that of Madamoifelle ROUYER at St Michael; both of whom can now ufe their arms very well *.

I may even add, without the fear of being accufed of vanity or prefumption, fentiments, which are as much ftrangers to my breaft, as they were to that of my father, that both he and I have fo uniformly fucceeded in thefe operations, that our town has become, in fome fort, the re-

* The hiftory of thefe cafes has not been preferved; therefore, I can only mention them.

fuge of the unfortunate, afflicted with carious joints, after they have tried all the means uſually recommended by profeſſional men, or have had recourſe to empyrical noſtrums, and when amputation ſeemed to be their laſt reſource, which ſometimes their ſurgeons have been unwilling to perform, afraid leſt ſome unknown cauſe, ſome latent virus, might render the operation fruitleſs.

GENERAL OBSERVATIONS.

The caſes which I have related clearly ſhew, that ſurgery poſſeſſes means, the moſt ſure, for the cure of caries in the elbow joint. The ſucceſs which we have met with, will lead, I am perſuaded, to the rejection of amputation, in all caſes of the kind. It would give me the moſt ſincere pleaſure, if it were in my power to ſay, how far this method of management may be applicable to the many other ſevere complaints, with which this joint is occaſionally affected. But, as I have no caſes of ſuch affections to bring forward, I could only reaſon

from analogy; which any other perſon may do, equally well with me.

"The exciſion of the carious extremities of "bones cannot be adviſed," ſays M. BOYER *, "in caſes of white or lymphatic ſwellings, ex- "cept the affection be confined to the articu- "lating cavities, and does not extend far among "the ſoft parts that ſurround the joint. If, for "example, the cellular ſubſtance and the liga- "ments, which are about the knee, be loaded "with lymph, and be ſo changed in ſtructure, "as to have become a homogeneous and lard- "like maſs, the extirpation of the joint, as pro- "poſed by PARK, would obviouſly be imprac- "ticable. This bold operation can only be "done, when the bones alone are affected."

This opinion has, without doubt, been taken up from a conviction, that, in an operation, which it would be cruel to perform without mature deliberation, nothing ought to be left to chance. I am thoroughly perſuaded, that, when the fleſh is ſo far changed, as to form,

* Leçons ſur les Maladies des Os, publiées par A. Richerand, tom. ii. p. 224.

with the ligaments, one *homogeneous and lard-like tiſſue*, the operation cannot poſſibly ſucceed. But is the bone, in any caſe of the kind, alone affected? In the preceding caſes, the fleſh was found to be very much diſeaſed, ulcerated, thickened, hard, and, in ſome places, changed into a lardaceous maſs; nevertheleſs, the operation did ſucceed. If this ſtate of the ſoft parts depend on the diſeaſe in the bone, one ſhould think, that, by removing the cauſe, all would get well. This is, in fact, what happened. I aver, with confidence, that this change takes place in a very ſhort time. My father was ſo much convinced of it, that, provided the fleſh was only alive, he did not heſitate to operate. Mr PARK is nearly of the ſame opinion; for, in the caſe of the knee joint, which he cured, he ſays, "the teguments were ſo ſtretched, that it "ſeemed ſcarcely poſſible they could allow of "farther diſtention."

This truth, I conſider as moſt important. My father ſaw it only by degrees; for, at firſt, as may be ſeen in the caſe of the ſhoulder joint, he believed, that it was abſolutely neceſſary to

remove the lardaceous cellular ſubſtance. There muſt be, without doubt, a point at which we ſhould ſtop; but my experience does not enable me to ſay, where that point may be.

The experiments of M. CHAUSSIER, on the hinge-like joints of animals, ſeem to weaken the facts which I have ſtated. That the difference between theſe experiments and my caſes may be ſeen, I ſhall quote the experiments here. In my opinion, we ſhould avoid all reaſonings, founded on analogy alone.

" * M. CHAUSSIER made the ſame experi-
" ment on the inferior extremity of the thigh
" bone, that he had made on the lower end of
" the bone of the arm, and on the lower end of
" the tibia. He even cut out, according to Mr
" PARK's method, the whole of the elbow and
" knee joints; but, though none of the animals,
" on which he made theſe experiments, died,
" the operations were always fruitleſs. The
" fleſh, as well as the bones that had been cut,
" healed perfectly well; but, in place of a new

* Mémoires de la Société Médicale d'Emulation, troiſième année.

"joint being formed, the extremities of the "bones continued at a diſtance from one ano- "ther; and the whole, below the joint, re- "mained a mere pendulous maſs, totally uſeleſs "to the animals in their movements. Beſides, "theſe operations on the ginglimoid joints are "very difficult, and very dangerous, on account "of the ramifications of the blood veſſels; and "can afford no hope of ſucceſs, becauſe the "joints are not ſurrounded and covered with a "ſufficient quantity of fleſh."

The motion of the fore-arm upon the arm, in ſo far, at leaſt, as flexion and extenſion are concerned, have been recovered, in all the caſes of which I have given an account; and this ſeems to have been owing to the care that was taken to preſerve the radial attachment of the biceps, and the ulnar attachment of the brachieus internus; or, at leaſt, by the preſervation of one or other of the two; without which, I believe, what the learned profeſſor found to happen, as I have ſtated, in his experiments, would have taken place—the motion of the hand only would have remained; a reaſon ſuf-

ficient, however, for performing the operation.

My father, in the memoir on the excifion of carious joints, which he prefented to the academy of furgery in 1782, was of opinion, that the operation at the elbow would end in a ftiff joint, or that the bones would anchylofe; and he propofed placing the arm of the patient in that pofition, which would render it, from its fhape, moft ufeful after they united. Hitherto, the bones have grown together after the operation at the knee joint; but things do not go on in the fame way as has been already ftated, at the joint of the elbow. When the whole of the joint is cut out, there always remains a fpace, very perceptible, between the two bones of the fore-arm and the bone of the arm. This is confirmed, by what has uniformly taken place, in the operations performed on thofe who were wounded, in the army of the Rhine. The fame was the cafe with the animals on which M. CHAUSSIER performed his experiments; except that anchylofis did not take place, at the knee. There is reafon to believe, that this difference arofe from difference of poflure.

I know nothing, as yet, of what goes on at the extremities of the bones, during the cure. Before any opinion can be formed on the ſubject, an opportunity muſt occur, for diſſecting ſome of the limbs that have been cured by this operation. Mr PARK thought that the bones would be lengthened, by the new growth of callus; but, the firſt Caſe which I have ſtated, ſhewed, that the limb was ſhortened three inches: ſo that, if there had been any lengthening of the bones by callus, it could not be very great. It will be ſeen, that nearly the ſame thing took place in the operation at the knee joint, which is to follow.

"In the arm *," ſays Mr PARK, "the ad-
"vantages ariſing from the preſervation of a
"hand and fingers, with all their original mo-
"tions, except thoſe of pronation and ſupina-
"tion, were ſo very evident, and ſo very conſi-
"derable, independent of the motions of the
"elbow, or of any conſiderations reſpecting
"the length of the arm, as not to leave room
"for a moment's heſitation."

* See page 12 of the preſent edition.

Mr PARK was indebted to his imagination, for this fore-knowledge of the reſult of an operation which he had never performed. It is ſurpriſing, that many of thoſe, who have taken ideas from his book, pretend, in what they ſay reſpecting the exciſion of the elbow, that, after the operation, the limb muſt be uſeleſs. The animals, of which M. CHAUSSIER ſpeaks, require their fore-legs, for ſtanding, walking, &c. It is obvious, that to them, theſe limbs, after the operation, muſt, for theſe purpoſes, have been uſeleſs, and even a burden. But, with regard to man, who makes uſe of his arms for other purpoſes, the caſe is very different. Pronation and ſupination remain; the motions are new, but the effect is the ſame. Mr PARK did not expect this.

What M. CHAUSSIER ſays, reſpecting the want of fleſh, for forming and maintaining the flaps, is juſt, in ſo far as the animals, on which he made his expèriments, are intereſted; but it does not apply to man, whoſe reſources are equal to what is wanted. It is true, that the ſucceſs of the operation depends on getting the

flaps united, as before the operation; and, with that view, we are careful to ſecure to them a free and plentiful circulation: at the ſame time, we make them large, that they may allow ſpace ſufficient, during the operation, for the removal of what is diſeaſed. All fear, on that point, would be ſuperfluous, ſince we cut nothing that is of any importance; for, the time of the cure is not in proportion to the ſize of the wound.

My method of operating differs from my father's, in this, that our patients were not placed in the ſame poſition; and, that I ſawed the os humeri before I diſlocated it. I ſhall ſtate what led me to do ſo.

The patient, in my father's firſt operation, was placed in a chair, and held by aſſiſtants; but the writhings of the man were ſuch, that he could not be held ſteady. This produced a great deal of embarraſſment and trouble. Diſſatisfied with this poſture, I adopted the one I have deſcribed, from which I have experienced ſingular advantage.

If the ſurgeon, in performing this operation,

try to diſlocate the os humeri, he will find, that the two articulating proceſſes of the ulna will give him ſome trouble. The difficulty is, indeed, almoſt inſurmountable, if the bones be very much enlarged. He will alſo find, that as the lower end of the os humeri projects forward, it is very difficult to inſinuate a ſharp inſtrument, ſo as to cut, from below upward, the fleſh that is attached to its anterior ſide. Theſe difficulties vaniſh, when the bone is previouſly cut above the joint; becauſe, then it can be moved, and drawn towards you, ſo as to be eaſily ſeparated from whatever adheres to it, and without any riſk of cutting more fleſh than we wiſh. This was the method which my father followed, in operating on the knee and foot, as will be ſeen hereafter.

I grant, that, by firſt ſawing off the olecranon, as Mr PARK adviſes, the os humeri can be more eaſily diſlocated. But, in that caſe, it would be neceſſary to inſinuate the cutting inſtrument before the ulna; and to carry it, in cutting, from below upwards, which is not an eaſy matter, and one, of which no opinion

ought to be formed, from operating on the dead ſubject. If, however, the length of the os humeri to be taken away, be ſhort, it will be neceſſary to begin by diſlocating the bone; and then, if the olecranon be found to be diſeaſed throughout, I am of opinion, that it would be right, previouſly to ſaw it too.

I do not think, that it is incumbent on me to bring forward reaſons in favour of the practice, which my father and I have adopted. Surgery ſhould be diveſted of every thing that is not intimately connected with it. Matters of this kind are eaſily underſtood. Mr PARK ſeems to have thought it to be his duty, to give to his method an air of importance. The ſimple hiſtory of the caſes themſelves, renders any reaſonings of mine unneceſſary.

Hœmorrhagy is not to be dreaded ſo much, as might be expected. No large blood-veſſel is injured. If any of the collateral or muſcular branches bleed ſo much, as to diſturb the operator, they can always be tied immediately, and with eaſe. But I can ſay decidedly, that the whole of theſe veſſels ceaſe to bleed, after a

certain quantity of blood is diſcharged. I never ſaw my father, in any operation of this kind, ſtop to tie a veſſel. At any rate, the tournequet is always at hand.

I ſhall finiſh theſe remarks, by mentioning, that whoever may wiſh to repeat theſe operations, would do well to provide himſelf with plenty of water and ſoft ſpunge. He will need nothing more. He will find, that he muſt waſh away the blood frequently, and wipe the bone, in order to examine its colour.

CHAP. II.

KNEE JOINT.

THE operation, of which I am now to give an account, was never put in practice before, except by Mr PARK. His ſucceſs ſhewed, that the moſt happy effects might be expected from it. The caſes, in which my father was concerned, have confirmed that expectation: and now, I believe, this operation, which was looked upon as a chimera, will, in future, be conſidered not only as tried and eſtabliſhed; but, as it enables us to ſave limbs, which hitherto were doomed to amputation, it will be eſteemed as one of the moſt admirable operations in ſurgery.

Many ſurgeons, in other reſpects expert, will be appalled at the difficulty of performing this operation; but I truſt, that when caſes become more numerous, they will feel themſelves conſtrained to adopt it in practice. I grant

that amputation is more eaſy, and a leſs painful operation; but it is no longer poſſible to maintain, that after exciſion, a limb muſt be uſeleſs. The reſults of the two operations differ from one another in ſo many important particulars, that no friend to humanity can heſitate which to prefer.

The method which my father followed, in performing this operation, was different from that of Mr PARK, in many reſpects; for which he has given his reaſons, after ſtating the caſe. I would adviſe, that all who wiſh to conſider the ſubject, ſhould conſult the work of the celebrated Engliſh ſurgeon.

CASE IV*.

The ſon of M. CLAUSE, apothecary at Chalons-ſur-Marne, was afflicted, for more than a year, with a ſwelling of conſiderable ſize in his knee. He could aſſign no cauſe for it. It had degenerated into ſeveral abſceſſes, which had

* This is one of my father's Caſes.—This account of it is alſo his.

been followed by fiſtulous ulcers; from which a fœtid, purulent matter, was diſcharged, and through which the probe could be paſſed into the joint, which was found to be rough and carious. The ſkin was livid and ædematous; the motion of the joint was loſt; and the patient, very much emaciated, could ſcarcely raiſe himſelf to be carried in a long chair, on which his leg lay.

The march of KELLERMANN's army had brought M. PERCY to our town. I took him to ſee this young man; and, I had the ſatisfaction to find, that his opinion was the ſame with mine. He had the goodneſs to be preſent at the operation; which was performed in the following manner, on the 17th September 1792. M. CHAMERLAT his colleague, M. GREMILIET ſurgeon major of the regiment of Chaſſeur cavalry, and ſeveral ſurgeons of the firſt rank in the army, likewiſe gave their aſſiſtance.

I made a longitudinal inciſion, between the vaſti and the flexors of the leg, down to the bone. Theſe inciſions were begun about two inches above the condyles of the femur, and

were carried down, along the ſides of the joint, till they reached the tibia. I united them, by a tranſverſe cut, which paſſed below the patella, penetrating to the bone.

I raiſed from the condyles, by diſſection, the flap which I had thus formed. The patella was attached to it; but, being diſeaſed, I diſſected it out. I then cauſed the limb to be bent, that I might bring the condyles of the femur into view. After having tried them by the gouge, and found that they were diſeaſed throughout, it became neceſſary to remove them entirely. Wiſhing to cut them off from the body of the bone, before I turned them out of the joint, I ſeparated what adhered to them behind, where they are joined to the body of the bone. I paſſed the fore-finger of my left hand through at that place, in order to preſs back the fleſh from the bone; and on that I ſawed. Then, cauſing the knee to be bent, I pulled the cut piece towards me, and ſeparated it eaſily from the fleſh and the ligaments, without any riſk.

The condyles of the tibia being found to be carious, it was neceſſary that they ſhould be

laid bare. In order to do this, I made an inciſion, nearly 18 lines in length, on the ſpine of the tibia. I extended my former lateral inciſion on the outer ſide the knee, nearly as far down upon the head of the fibula. By theſe means, I obtained one flap, that adhered to the fleſh, which filled up exteriorly the interoſſeous ſpace; and another triangular flap, formed by the ſkin, which covers the inner face of the tibia; which bone I was obliged to lay bare, before I could apply my ſaw.

Upon raiſing the outer flap, the head of the fibula came into view; which, after being ſeparated from its attachments, I cut off with a ſmall ſaw. I then raiſed the inner flap, and, ſeparating the condyles of the tibia from the fleſh behind, I ſawed off from them a piece, about ten lines in length. The reſt was ſound.

I placed the leg in the poſition in which it ought to be, with reſpect to the thigh; I laid down the flaps, and brought them together by a few ſtitches. The wound was dreſſed with pledgets, dipped in cerate, over which dry caddis was laid. The whole was ſupported by com-

preſſes, ſurrounded by the eighteen-tailed bandage. The patient was laid in bed, in the moſt eaſy poſture.

During the firſt day, the pain was conſiderable. Next day, he was more eaſy. I thought it right to renew the dreſſings, and I applied a machine for keeping the limb in its proper ſituation.

This machine was compoſed of a board, the length of the diſeaſed limb. It was bevelled at the upper end, that it might not hurt the thigh; and ſcooped out before, that it might receive the heel. It terminated in a ſole; and, at the ſides, it had ledges of wood, which ſlipped eaſily into grooves; and as theſe ledges roſe higher than the dreſſings, there was no need of a baſket to bear up the bed-clothes. I likewiſe prepared cuſhions of baked hair, one of which I put between the limb and the under board, and the other two I placed, one on each ſide, between the limb and the ſide-boards. The foot reſted againſt the ſole, to which it was fixed by a tape.

The dreſſings now were eaſy, both to the patient and to me. I had nothing to do but to pull up the ledges, and to take out the lateral cuſhions. Then the wounds were uncovered; upon which I again applied the caddis, the compreſſes, and the bandage, moiſtened with warm water; then I replaced the cuſhions, and the ſide-boards. If I wiſhed to change the cuſhion below, and the eighteen-tailed bandage, nothing was more eaſy. An aſſiſtant raiſed the limb, without deranging its poſture, and I replaced what I had taken away. At laſt, I raiſed the limb, and the patient himſelf changed the cuſhion.

By means of this apparatus, I got my patient out of bed, on the 3d day after the operation; and I laid him on a low chair. At the end of the 15th day, I placed him in an arm chair, ſo that the upper end of the plank reſted on the arm chair, and the lower end on a chair of the ſame height. Nothing could be more eaſy than getting him up, and laying him down again.

It is ſcarcely poſſible to conceive, how well things went on with this patient after the ope-

ration. During the firſt days, he was feveriſh, reſtleſs, and got little ſleep. On the 4th, the wound was painful and ſwollen, and the matter diſcharged was fœtid and copious. On the 7th, he was remarkably eaſy. The ſuppuration abated very ſoon thereafter, and the wounds began to cloſe. In a month, there remained only one opening at each angle of the crural flap, and another at the angle of the flaps of the leg, by which good pus iſſued from the interior of the wound. The bones had come together, and were conſolidated to ſuch a degree, that, when the patient attempted to turn his thigh in bed, the leg turned at the ſame time.

At the end of the 3d month, the conſolidation of the bones was ſuch, that I left the limb at liberty in bed; the patient moved it about at his pleaſure. I uſed the plank, only in getting him out of bed. In ſhort, I flattered myſelf, that I ſhould be able to make him walk upon crutches, in a month or ſix weeks; but an event, with which my operation had nothing to do, deprived me of that ſatisfaction. The Pruſſians, in retiring from the French territory,

left behind them an epidemic dysentery, which, as is well known, carried off the greater part of those who were seized with it. It got into the military hospital at Bar, of which I had the charge, and was communicated to my patient, whom I dressed every day. He could not bear up against it. On the 15th day, he died, three months and a half after the operation.

This unfortunate accident deprived me of the pleasure of enjoying the fruits of my care; but I remained convinced of the utility of the operation, and persuaded of the propriety and necessity of performing it, in similar cases. I looked on my patient as cured, for I had no relapse to dread.

I expected that the limb would not have been shortened, in proportion to the length of the bones cut off. But I was deceived; the shortening was considerable.

GENERAL REMARKS *.

Before Mr PARK's work was known, I had thought of applying my method of operating, to cafes of difeafed knee joint. His fuccefs confirmed me in my refolution, but did not influence my practice. As this fubject is new, and of no mean intereft, it is neceffary that I fhould explain the motives which directed my practice.

"An inciſion was made," fays Mr PARK, "beginning about two inches above the upper "end of the patella, and continued about as far "below its lower extremity; another, croffing "this at right angles, immediately above the "patella, the leg being in an extended ſtate, "was made through the tendons of the exten-"for muſcles down to the knee."

This manner of operating appeared to me, to be fraught with inconveniences.—Firſt, There are four flaps, which muſt embarraſs the operator exceedingly:—2dly, The inferior flaps are

* Theſe Remarks are alſo my father's.

compoſed of almoſt nothing but ſkin; and, as they are long, I thought they would not be ſufficiently nouriſhed; and it is againſt this I have endeavoured to guard:—3dly, In caſes, where a large portion of the tibia and fibula are to be removed, the difficulty would be great, with the longitudinal inciſion, which Mr PARK makes, upon the ſpine of the tibia:—4thly, If the end of the tibia be carious, in a few points only, my upper flap alone is enough for me. Mr PARK, in ſo far as I can ſee, does not ſeem to have it thus in his power to ſtop ſhort.—5thly, The fear which this ſurgeon manifeſts, about wounding the capſule, and the precautions he uſes to preſerve it entire, are altogether viſionary; for, in this operation, the capſule is unworthy of notice:—6thly, His tin caſe appears to me to be a bad contrivance, becauſe it cannot prevent the leg from altering its poſition, with regard to the thigh; and becauſe the limb muſt be lifted out of it, in order to be dreſſed. The apparatus which I uſe has not theſe inconveniences.

I am ſo much convinced of the great merit of this author, a few points of whoſe practice I thus criticiſe, as to intreat, that theſe obſervations may not be conſidered as intended to leſſen the value of his labours. But, having followed a path different from his, I have deemed theſe reaſons, for the difference in our practice, due to thoſe who may wiſh to follow us.

CHAP. III.

ANKLE JOINT.

IN offering to the public the two following Caſes, of Caries of the Ankle Joint, treated ſucceſsfully by exciſion, I believe I am the firſt who has ſpoken on the ſubject. My father, in thinking how he ſhould proceed, felt how difficult it was to ſteer clear of the tendons, the blood-veſſels, and the nerves, which ſurround this joint; but at laſt he made his mind up, and his attempt was crowned with the moſt happy ſucceſs. I ſhould think that his example will be imitated, and that amputation will be reſerved for other caſes than thoſe of caries in the ankle.

CASE V.

The ſon of M. LUCOT, inſpector of Gendarmerie, met with a ſprain in the year 1791, which, by a train of croſs accidents, ended in

an extenſive caries of the left ankle. In about a year after the ſprain had been received, there was a fiſtulous ulcer on each ſide of the joint, from which a ſanious and fœtid pus was diſcharged; and the probe being introduced through the openings, the articulating ſurface of the tibia, as well as that of the fibula, and the body of the aſtragulus, were felt to be bare. The foot, and lower part of the leg, were ſwelled. There was a dull pain in the diſeaſed part, and the patient could not lean his weight on the limb.

Amputation, moſt certainly, was the only hope for relief, which ſurgery could afford. But my father thought, that the caſe was one which came within the range of his mode of practice; and, on the 15th of April 1792, he performed the operation, in the following way.

He made a longitudinal inciſion, beginning at the inferior and poſterior part of the maleolus internus, continuing it upwards, from three to four inches. He then made another inciſion, tranſverſe, which extended from the inferior end of the former inciſion, to the edge of the tendon of the peroneus brevis.

He made another longitudinal inciſion, on the inſide, which began at the inferior and poſterior part of the maleolus (internus), and extended from three to four inches along the internal border of the tibia. Then, by a third inciſion, which began at the lower end of this, he cut the ſkin tranſverſely, till he came to the tendon of the tibialis antieus.

He diſengaged the fibula from the tendons, the ligaments, and, in general, from every thing by which, at its inferior extremity, it is held in its ſituation. He paſſed the handle of a ſcalpel under it, and, with a chiſel, he cut it acroſs, above the ankle. Perceiving that the bone was affected, ſtill higher up, he took away ſix lines more.

Wiſhing to cut the tibia above the maleolus, before he turned it out of the joint, he ſeparated every thing that adhered to it; and then, paſſing the handle of his ſcalpel between the poſterior ſurface of the bone and the fleſh which had been detached from it, he introduced, between the ſpine of the bone and the fleſh before the bone, the blade of a narrow ſaw,

fixed in a handle; and cut the bone, ſawing from before backward, which was a work of no ſmall trouble. That being done, he turned the foot outward, and, making the piece of bone which he had cut off project, he detached it from the tarſus without difficulty.

The aſtragulus being diſeaſed, he removed the whole of its articulating ſurface, and a great part of its body, till he came down to what was ſound.

The foot was placed in the moſt natural poſition, with regard to the leg; the flaps were brought together, and ſecured by a ſtitch at each of their points; the wounds were covered with lint, dipped in cerate; and the whole was ſurrounded by compreſſes and the eighteen-tailed bandage.

To keep the foot ſteady, he got two pieces of tin-plate, and, placing one on each ſide of the leg and foot, he ſtuffed them with hair cuſhions, and bound the whole to the limb, by tapes that tied before. The foot reſted againſt a ſole plate, fixed to the ſide plates; and a hoop, placed over all, bore up the blankets.

When he dreſſed this wound, he made two aſſiſtants ſupport the knee and the foot. He then removed the ſole plate, the ſide plates, and the bandages; applied new caddis to the wound, and replaced the apparatus.

The patient was put on a low diet, for ſome days, after the operation. His drink was barley-water with milk. He was feveriſh for five days. The diſcharge was, at firſt, profuſe and fœtid; but, in a ſhort time, it began to diminiſh, and to become better.

In ſix weeks, the wounds were contracted to the eighth of their original ſize; and the union of the foot to the leg had proceeded ſo far, that it was not neceſſary to ſupport it during the dreſſing. The uſe of the tin plates, however, was continued.

At the end of three months, the progreſs of the cure was retarded by an abſceſs, which was treated with emollient cataplaſms; but ſix weeks elapſed before it was healed: and very ſoon thereafter, a dartarous eruption followed, which was alſo got cured.

Theſe two unlucky occurrences prevented the

patient from being able to lean his weight upon the foot, till the 6th month. During the 7th, he uſed crutches. In the 8th month, he could walk with a ſtick; and by the end of the 9th, he walked without any aſſiſtance whatever, and in ſuch a way, that he could do what he pleaſed.

This leg is not preciſely like the other. There is a very evident want, at the outer ankle. There was a ſwelling, for a conſiderable time, on the inner ſide, immediately over the junction of the foot to the leg. This, however, gradually diminiſhed, and at laſt went away. The foot is drawn up to the leg; ſo that the limb is, upon the whole, about an inch ſhorter than it was. A new joint, between the tibia and aſtragulus, has not been formed; but the aſtragulus has acquired a degree of motion on the os naviculare, the os calcis on the os cuboides, and the other bones of the tarſus have acquired a motion upon one another, that is wonderful, and makes up, in a great meaſure, for the motion of the ankle joint, which is loſt; ſo that, with a high-heel'd ſhoe, this man now walks without halting.

The limb was examined, ſome months after the operation, by M. PERCY and CHAMERLAT; who could not help expreſſing their aſtoniſhment, at a cure that had been ſo ſpeedy, and a reſult ſo ſurpriſing.

CASE VI.

LEWIS MEUNIER was affected, when young, and without any known cauſe, with a caries in the left ankle joint. To ſay that all the topical applications, which are held in eſteem by the weak minded, had been tried, would be only repeating a remark that might be applied to all the caſes which I am relating; for the ſick cannot brook the idea of an operation, till they find that nothing elſe can be done.

I was conſulted in the year 1796. The patient was 17 years of age, of a delicate conſtitution, but otherwiſe in good health. There had been glandular ulcers, when he was 14 years of age, in the arm-pit and groin, of which nothing now remained but the remembrance. The diſeaſed joint was very much ſwelled; the

ſkin was ædematous and livid; the leg was very much emaciated, and bore the ſcars of ulcers, long ago healed.

The ankle was conſiderably enlarged; he had loſt the power of moving the joint. The bones of the tarſus, alſo, were immovable; ſo that, in walking, he was obliged to bring the foot round with a ſweep. There were two ulcers on the inner ſide, which gave vent to the matter of two ſinuſes. Through the anterior opening, the probe could be paſſed, along the inner ſide of the aſtragulus; and, by the poſterior, it paſſed along the ſame bone backward, into a cavity, the bottom of which could not be felt, on account of its crooked direction, and the pain which the patient felt there from the probe. The diſcharge was a ſanious ichor, which tinged the linen with a black ſtain.

It was determined that the diſeaſed bones ſhould be cut out, and I performed the operation in the following way.

I made a tranſverſe inciſion, below the maleolus internus, which extended from its poſterior edge to the junction of the aſtragulus with

the os naviculare. I carried another inciſion from the anterior end of this inciſion, for about an inch, directly towards the ſole of the foot. Then I led a third from its poſterior end, towards the os calcis, directing my ſcalpel ſo as to avoid the arteries which paſs along the ſurface of that bone.

I raiſed the flap, by diſſecting it from what it covered, and ſaw that the aſtragulus required to be removed. I took off a little from it with the gouge; but finding the maleolus internus to be in my way, I was obliged to go to the tibia.

I made a longitudinal inciſion, of about two inches in length, upon the anterior edge of this bone: it joined the tranſverſe wound below. I got, by theſe means, a triangular flap, which was connected to the fleſh, on the poſterior ſide of the tibia; and I had it in my power to preſerve the tendons, which paſs along behind that bone. I raiſed this flap by diſſection. The whole of the lower end of the tibia was carious. Finding it impoſſible, on account of the fibula, ſo to inſulate the tibia as to get the ſaw applied,

I was obliged to pare away all that part of it which was diſeaſed, with the gouge, which involved me in a good deal of trouble.

In this way, I got at laſt about an inch and a half of the bone removed. Above that, the ſolid part of the bone was found. But this was far from being the caſe with the cancelli, which were ſo much diſeaſed, that I was obliged to introduce the gouge, and take away about two inches of them *.

This being done, I took away the remainder of the aſtragulus. The other bones of the tarſus being found, I did not touch them. At laſt, I laid down the flaps, and ſecured them by ſtitches.

The patient was put to bed, with his foot laid on its outer edge, and reſting on a pillow of chaff, on which a cloth had been previouſly laid. The wounds were covered with pledgets,

* Perhaps it will be thought, that when theſe cells are deſtroyed, the bony cylinder that covered them would die; but that is not the caſe. If we were deprived of this reſource, the quantity of bone to be taken away would ſometimes be ſo enormous, that the operation ought not to be attempted.

dipt in cerate; over which, dry caddis was laid; and the whole was ſurrounded with compreſſes and the eighteen-tail'd bandage.

During the two firſt days, the wound diſcharged a great deal of bloody ſanies; the patient was feveriſh and reſtleſs. In a few days, he became quite eaſy, and the ſuppuration came on more kindly.

I intended to make my patient lie in bed, till I thought the tibia was ſufficiently firm to bear his weight. Then, by giving him crutches, I thought I ſhould be able, by gentle and gradual exerciſe, to get him the length of leaning his weight upon the heel; but he was young, and, at the end of ſix weeks, finding himſelf ſtrong, I could no longer reſtrain him. He got up, took his crutches, and ran reckleſsly wherever he pleaſed. The completion of the cure was retarded; the wounds were a long time in healing; the fibula, having no aſſiſtance from the tibia, in ſuſtaining the weight which it was obliged to ſupport, ſunk down upon the external ſide of the foot, which was thrown in-

wards *; ſo that this lad reſts now on the outſide of his foot: that, however, does not prevent him from walking. For a long time, he needed crutches; at laſt, he has been able to do without them.

There is now no joint at the ankle; but the bones of the tarſus do the duty of the ankle joint, as in the preceding caſe.

The inferior extremity of the tibia is in part regenerated. You can feel, in the place where the void was, bone that is very ſolid, and of the ſhape of the tibia.

In performing this operation, I allowed the inferior extremity of the fibula to remain; thinking, that nature, by reproducing that portion of the tibia which I took away, would finally give, by both bones, a ſolid ſupport to the patient. I founded this expectation on my father's experience, in the caſe in which he met with the reproduction of a great part of the tibia, that had been removed, the fibula being left entire.

* I had cauſed plates to be made, as in the former caſe; but the patient would not put them on, except when in bed, and that without my knowledge.

But whether the imprudence of my patient was to be blamed, or that my expectations were too ſanguine, the event, as I have ſtated, was not what I expected. In a ſimilar caſe now, I would determine to cut off as much from the fibula as from the tibia. The ſhortening would be greater, but the cure would be effected more eaſily, and in a ſhorter time.

The two caſes which I have ſtated, ſhew, that the difficulty of laying the bones bare enough, ſo as to get them eaſily ſawed, renders the exciſion of the ankle joint a very troubleſome operation.

The tendons, the veſſels, and the nerves, which ſurround this joint, muſt be preſerved; and to do this, great care muſt be taken in making the tranſverſe inciſion; the conſequence of which is, that the wound being ſmall, patience and caution are neceſſary in ſawing the bone.

As the flaps of the leg can be formed of ſkin only, they ſhould be ſmall; and care ſhould be taken to preſerve their intercourſe, both with the fleſh before and behind the joint.

This operation is, perhaps, the moſt difficult

of all thoſe I have deſcribed. The caſe I have related is not ſo intereſting as that by my father. I, indeed, have accompliſhed a cure; but the functions of the limb are not ſo completely recovered. From what I have ſtated, it will be ſeen, that I think I have diſcovered the cauſe of the failure. As this method of operating is new, I have ventured to indulge the hope, that what I have ſtated will help, in ſome degree, to lead to a more general practice.

The wounds, which are the effects of the operations I have deſcribed, heal ſurpriſingly faſt at the beginning; but, during the progreſs of the cure, ſmall ſinuſes or ulcers remain, which, continuing to diſcharge a ſerous pus, are tedious in their cure. They are ſometimes kept from healing, by little ſcales, which produce ſuppurations, and are diſcharged from time to time, when leaſt expected. But, notwithſtanding all theſe things, nature makes the cure complete; ſo that they ſcarcely deſerve to be farther noticed. We judge our patients cured, when they have got ſo far; and, in fact, theſe ſecondary ulcers, after a ſhorter or a longer time, heal up, and never open more.

CHAP. IV.

TARSAL JOINT.

CARIES of the Tarſal Bones is very frequent. Their ſpongy texture, and the cloſeneſs of their articulations, are perhaps the cauſes of the rapidity with which caries ſpreads among them. The conſequence is, that ſurgeons are frequently obliged to remove them.

Theſe operations are not very difficult; the bones are eaſily laid bare, and the flaps have ſufficient nouriſhment. The chief difficulty lies in diſlocating the bones which we want to remove. The hold that can be got of them is ſo trifling, their articulating ſurfaces are ſo numerous, and their joinings ſo cloſe, that it is freqently very difficult to get them disjointed. Be that, however, as it may, the event is always pleaſing; the cure goes on rapidly; in a ſhort time, the patient is able to uſe his limb, as if nothing had been loſt; he halts for a few

months; but, in the end, he walks without limping.

Caries of the heel bone is by no means ſo promiſing. If its inferior ſurface be cut away, the heel can no longer ſupport the weight of the body; and the patient is obliged to lean, thereafter, on the anterior part of the ſole of the foot, till he accuſtom himſelf to uſe a high-heel'd ſhoe. If the caſe be ſuch, that the tendo Achilles muſt be deſtroyed, it would be better to amputate the limb. I have performed this operation, once only. I ſcooped out the whole inferior ſurface of the os calcis; I preſerved the inſertion of the tendo Achilles. The power of motion has been recovered, as I have ſtated, and a cure has been effected.

The bones of the metatarſus frequently become carious. In general, the diſeaſe is produced in them, from their connection with the tarſal bones. If the root, or upper end only, of a metatarſal bone, be affected, the diſeaſed part may be cut out, and the ſound part may be allowed to remain; but, if the anterior part, or if the whole of the bone, be diſeaſed, it

ſhould be taken away; and, as the correſponding toe would then have little or no ſupport, it would, if left, be uſeleſs.

The extirpation of theſe bones is not eaſy, on account of their articulations with the tarſus and toes. If one of the bones only be diſeaſed, there is no need of a flap; a longitudinal inciſion, along the upper ſurface of the foot, is all that is required. The lips of the wound can afterwards be eaſily brought together, and they will unite readily.

There is a riſk of cutting the plantar arch, but that is of no conſequence. I have never found it neceſſary to uſe a ligature: at any rate, it is eaſy to ſuppreſs the hœmorrhagy. I have performed this operation often, but I neglected to take notes of the caſes.

What I have ſaid of the metatarſal bones, may be applied, and does apply, to the bones of the metacarpus.

The bones of the carpus, like thoſe of the tarſus, are often ſubject to caries. In them, the diſeaſe makes rapid progreſs. Very often, the whole of theſe little bones, the roots of the

metacarpal bones, and the articulations of the carpal bones with the bones of the fore-arm, are affected, before the ſurgeon is conſulted; and when the diſeaſe has advanced ſo far, nothing but amputation can be recommended.

Caries of the wriſt joint admits of exciſion. I have performed the operation once, and with ſucceſs. I kept no notes of the caſe; but I remember, that the patient retained the movements of the fingers, and in part recovered that of the wriſt. And here I would remark, that if the end of one of the bones only be cut off, the hand falls to that ſide. Therefore, it is neceſſary that both the bones be cut, and at equal lengths, as was obſerved reſpecting the ankle joint.

It is proper to take care of the tendons; and, on that account, it is neceſſary that the joint be laid open at the ſides.

I have only one caſe to ſtate, of the many that have been performed, on account of caries in the bones of the Tarſus. It will give ſome idea of the general method that ſhould be purſued.

CASE VII.

In 1788, my father was consulted in the case of the son of M. VARINOT, at Savonnières, in Pertois. Six weeks before that time, this young man had received a blow on the upper part of his foot, from which many disagreeable consequences had resulted; and, at the time my father saw him, the foot and the lower part of the leg were very much swelled. There was an ulcer opposite to the os cuboides, about an inch in diameter, which discharged a sanious pus. There was another between the third and fourth metatarsal bone, produced by an incision made some days before, in opening an abscess. When the probe was introduced, it penetrated into the os cuboides; and the existence of a caries was ascertained, but its extent could not be known.

The operation being determined upon, my father made an incision on the outside of the foot, beginning about one-third from the upper end of the fifth metatarsal bone, and carrying

it up above the anterior apophyſe of the os calcis, paſſing through the old ulcer already mentioned. The inciſion formerly made, between the third and fourth metatarſal bones, being large enough, he made a cut acroſs, ſo as to connect the two. He raiſed from the bone, the flap which he had thus formed, and made it be held up.

He was obliged to remove the cuboid bone, the third cuneiform bone, the poſterior extremity of the fourth metatarſal bone, as likewiſe the inner ſide of the root of the fifth metatarſal bone, and, at laſt, the articulating ſurface, by which the os calcis is connected with the os cuboides. The tendon of the peroneus longus was ſpared, and lay bare at the bottom of the wound. He brought down the flap, and ſecured it by a couple of ſtitches.

From the 4th to the 8th day, there was a good deal of ſwelling. On the 5th, the ſtitches were cut. Between the 9th and the 12th, the ſwelling and pain abated, a plentiful ſuppuration came on, and things began to look well. Soon thereafter, the wound at the inner and

lower ſide of the foot began to heal. That on the outer ſide continued to diſcharge a great quantity of purulent matter.

The ſpace, from which the bones had been taken, became filled with a ſubſtance, which has become bony. The motion of the foot is completely recovered. The patient walked with crutches at firſt; at length he threw them aſide; and now he walks as well as ever, and the foot is not in the leaſt deformed.

CHAP. V.

SHOULDER JOINT.

I PROMISED to give the caſe, in which my father cut out the articulating ends of the bones of the Shoulder Joint; which caſe, he ſent to the academy of ſurgery. In this caſe, there will be found a method of operating, which is different from what is commonly recommended; but it will be ſeen, that the mode he here purſued, put it in his power to aſcertain the whole extent of the diſeaſe. Afterwards, he tried the ſame method, with the moſt happy ſucceſs, in a caſe of ſpina ventoſa. Every one muſt ſee, that too many facts cannot be collected, and brought to bear upon one point, in a matter ſo eſſentially neceſſary to the improvement of ſurgery. The caſe was as follows.

CASE VIII.

On the 15th of June 1786, my father was called to ſee the wife of M. VIRY, proprietor of the forges at Couſances. She was in her 45th year. She had, for ten months, been affected with a complaint in the left ſhoulder joint. The ſhoulder and arm were very much ſwelled. The fore-arm and hand were ædematous. When any attempt was made to move the joint, ſhe felt the moſt acute pain. Indeed, ſhe was in conſtant uneaſineſs, had loſt her appetite, and got little ſleep.

Some months previous to the time when my father was conſulted, M. BALTHAZARD, ſurgeon in the town, had, on account of an abſceſs, made a longitudinal inciſion, about three inches in length, on the fore-ſide of the joint.

My father, being of opinion that the joint was carious, perſuaded the woman to have the diſeaſed parts removed; which he accompliſhed, on the 8th of July, in the following manner.

He made a longitudinal inciſion, on the poſ-

terior ſide of the joint, beginning a few lines below the acromion, from which it extended, three inches downwards. This inciſion was parallel to, and four inches diſtant from, the one which had been formerly made. He laid them into one above, by a tranſverſe inciſion, which cut through the fleſh, about ſix lines below the upper attachment of the deltoid muſcle. Thus, a large flap, of about four inches in breadth, and three in length, was produced; which, after being detached from the bone, he folded down on the arm.

He next made two other inciſions, one from each end of the tranſverſe inciſion. The anterior of theſe pointed towards the outer end of the clavicle, and the poſterior towards the ſpine of the ſcapula. This gave him a new flap, which he raiſed; and then he had no difficulty in diſcovering the whole extent of the caries.

This done, he diſlocated the os humeri; and having puſhed it up, and aſcertained how far down the caries extended, he there ſawed the bone acroſs: after which, with the gouge, he rounded the corners of that part of the bone which was left.

He next lowered the arm, and made it be held close to the side; and then, with ease, he removed by the gouge, the whole external angle of the scapula, together with a part of the acromion.

After having taken away as much of the cellular substance, that was filled with hardened lymphatic matter, as he could, he put the patient to bed, and placed the limb in such a position, that the arm formed a right angle with the trunk, the elbow joint being half bent. He brought the flaps together, fixed them by stitches, and covered the wounds with caddis, which he secured by compresses and the eighteen-tail'd bandage.

During the 1st day, the patient was in great pain. The following night, she got a little sleep. For some days, she was feverish. Till the 8th, she was kept on a low diet: then she was allowed something more nourishing. On the 11th, she was permitted to rise for a little. On the 14th, she did not feel much pain when the arm was moved gently; the upper wounds were beginning to unite; the anterior and pos-

terior humeral flaps were diſcharging pus, both good in kind, and abundant in quantity; and the œdema was diſappearing. A ſmall quantity of bark was ordered for a few days, and her bowels were regularly kept open. On the 21ſt day, the ſuppuration had nearly ſubſided, and ſhe could move the arm.

In the month of October following, the cure was retarded by a phlegmonic tumour, which appeared ſpontaneouſly on the middle of the arm. It had no communication with the wound, and, in a ſhort time, it healed.

After the cure was complete, a hollowneſs remained at the top of the ſhoulder, as in luxations of the humerus, downwards. The upper end of the os humeri reſts on the ribs, anterior to the external edge of the ſcapula. In ſo far as can be perceived, its ſize is nearly the ſame; and it has formed a kind of ſymphyſis with the ſurrounding parts, in ſuch a way, that the arm can perform all its motions, except that of elevation, which is very much confined.

IT was my wiſh to ſhew, by the evidence of facts, that exciſion of joints, affected with caries, is, in many caſes, a very practicable operation; and one that holds forth advantages ſo unequivocal, that amputation ought to be proſcribed, in every caſe where exciſion may be performed.

Experienced ſurgeons ſhould be my judges. It reſts with them to ſay, whether I have ſucceeded or not.

THE END.

OBSERVATIONS

BY

JAMES JEFFRAY, M. D.

Profeſſor of Anatomy and Surgery in the College of Glaſgow.

TO THE

STUDENTS of ANATOMY and SURGERY

IN THE

UNIVERSITY OF GLASGOW.

GENTLEMEN,

IN reading Mr MOREAU's Work, I began to take notes, which I intended to insert into the Lectures annually given here for your use; but as I proceeded, the subject became so interesting, that I thought it would be doing you a more essential service, if I translated the book altogether. In doing this, I was forcibly struck with the propriety of Mr MOREAU's advice, that all who read his Cases should consult the work of Mr PARK also. That, however, can be done

by few, as Mr PARK's book is very ſcarce. Therefore, I have thought it right, with his approbation, to republiſh his original Letter to Mr POTT; together with the account of his Second Operation, as publiſhed in the London Medical Journal. At the ſame time, he has put it in my power to lay before you, the Reſult of his later Obſervations and Practice. In juſtice to him, it ſhould be ſtated, that, with modeſty that equals his merit, he has anxiouſly wiſhed that his papers ſhould not precede, but follow the tranſlation of Mr MOREAU's work, as an Appendix. In this, I have unwillingly ventured to differ from him in opinion; for I am certain that you will underſtand the ſubject better, if you read the different treatiſes in the order in which they were publiſhed. There are many references in Mr MOREAU's work to, and ſeveral criticiſms on, Mr PARK's book, reſpecting which, you would not have been prepared to form an opinion, if you had not been previouſly acquainted with the work to which the references are made. For the ſame reaſons, Mr PARK's laſt Communication ſhould have

been placed after Mr MOREAU's treatiſe; but unfortunately, by miſtake, it has been placed before it. You will not, however, find your time miſpent, if, after you have read Mr MOREAU's Caſes, you read that Communication again.

Though Mr PARK had ſhewn, by his ſucceſs in cutting out the extremities of the bones of the knee, that the Exciſion of Carious Joints was not only practicable, but ſafe, which was the great point to be determined, he was far from thinking that the method of operating, which he had followed, was either the beſt, or the only method that might be deviſed. In his experiment on the Elbow Joint, you muſt have ſeen, that he begun the operation in one way, but, meeting with difficulties that had not been foreſeen, he was obliged to finiſh it in another manner; and, in the poſtſcript to his letter (p. 45), he mentions a third way, by which, in ſome few caſes, he thinks the end might be better obtained. It was not to be expected, that an operation ſo novel, ſo difficult, and, at the ſame time, ſo formidable, could be re-

duced to rule, and made perfect, by a few trials. In this point of view, Mr MOREAU's Cases, which are numerous, and were managed in a way, different, in many respects, from that of Mr PARK, are highly valuable. But, though they were all successful, some of them even beyond expectation, and have thereby had the effect of bringing the operation into practice in France, especially in the armies, I should be sorry if, on that account, you thought that the operation may now be considered as perfect. More cases, varying in their circumstances and mode of management, may soon be expected; from which I persuade myself it will be seen, that the operation is not only capable of being still farther improved, but that attempts have been made, and with success, to render it more simple and efficacious. In the mean time, permit me to state to you a few circumstances, respecting the cases with which we are already acquainted, which make me anxiously wish, that you should think for yourselves, before you attempt to perform this operation.

The first circumstance which must, I think,

Fig. 1.

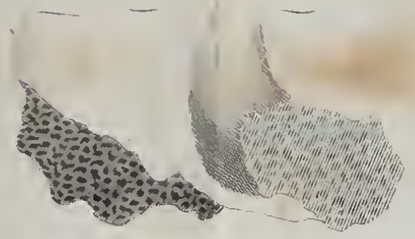


Fig. 2.

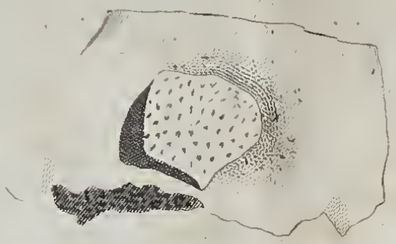


Fig. 3.

Fig. 4.

Fig. 5.

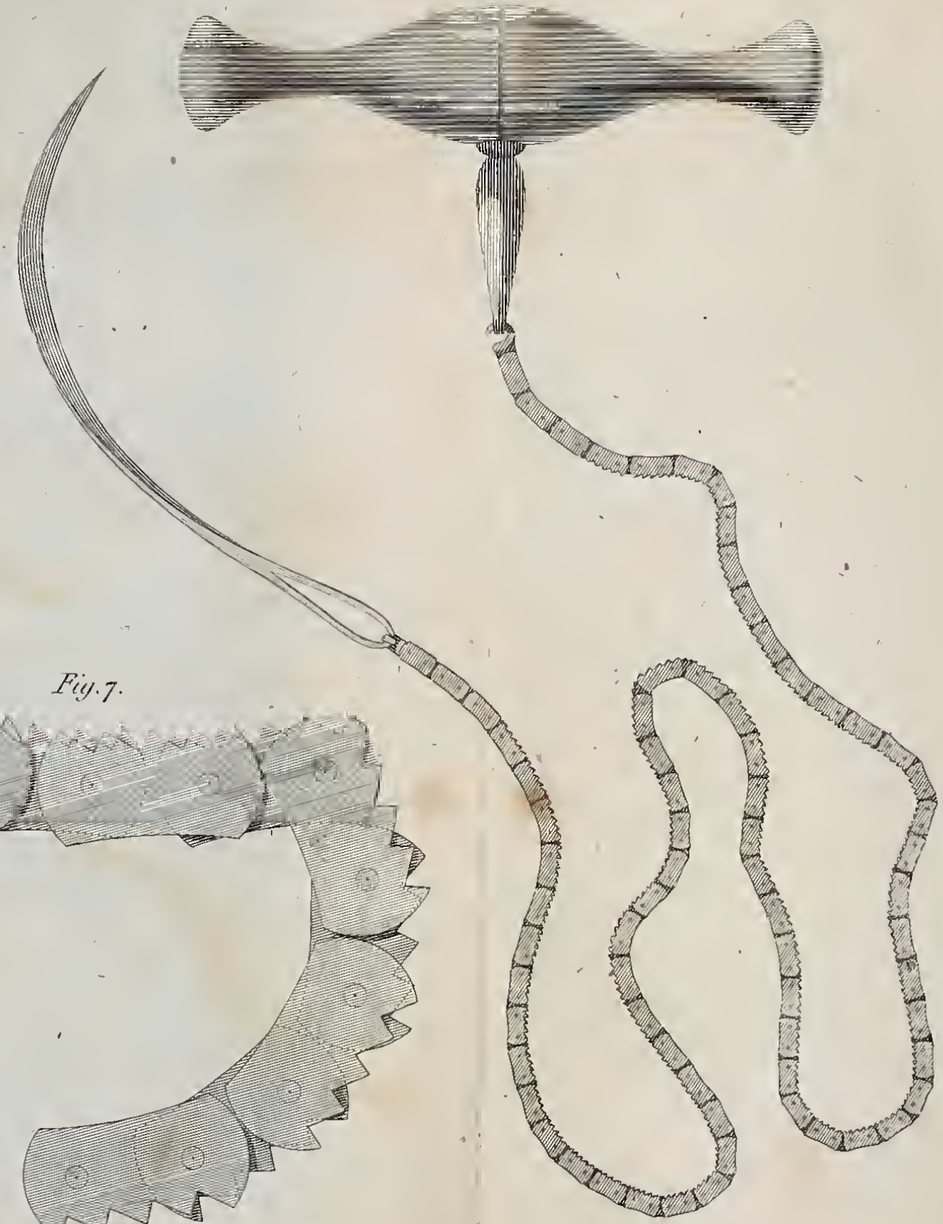


Fig. 6.

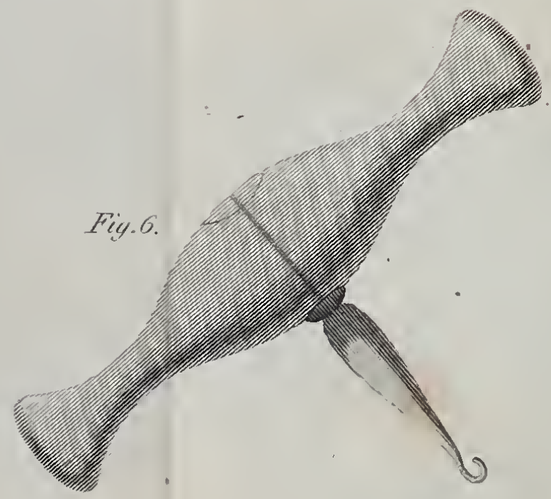


Fig. 7.

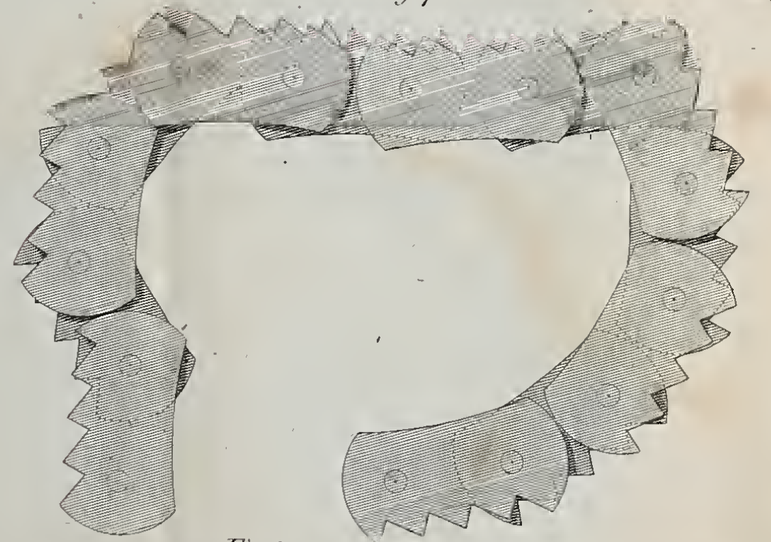
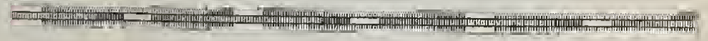


Fig. 8.



Drawn by Peter Nicholson.

Haldane sculp.

have ſtruck you, in reading theſe treatiſes, is the difficulty of getting the bones cut, without injuring the ſoft parts with the ſaw. Mr PARK, you will ſee, was obliged to make a crucial inciſion, and to raiſe four flaps by diſſection, in order to get the fleſh drawn back, out of the way of the ſaw; and Mr MOREAU, in ſome caſes, could not uſe the ſaw, from fear of injuring the tendons, the blood veſſels, and the nerves; but was obliged to pare away the diſeaſed parts of the bone with a gouge, or to cut them with a chiſel.

The common ſaw, whatever be its ſize, being ſtraight on its cutting edge, and, on that account, acting in a direct line on every thing that comes in its way, is ill adapted for this operation, when the bones are deep ſunk among the fleſh. The ſoft parts, it is true, may be depreſſed, or they may be drawn aſide, or they may be defended by ſome ſolid ſubſtance, introduced between them and the bone; but the difficulty of doing this in ſome caſes, the impoſſibility of doing it in others, and the extent of the wound neceſſary to get it effected in all,

are apparent, and have had no ſmall ſhare in deterring ſurgeons, in this country at leaſt, from attempting the operation; nor is there much reaſon to expect, that this operation will, in many caſes, ſuperſede amputation, unleſs ſome method be fallen upon, to get the diſeaſed bones removed in a more eaſy, ſafe, and expeditious manner; for which reaſon, I am very anxious that this part of the ſubject ſhould become an object of your ſerious conſideration.

Very ſoon after Mr PARK's book appeared, I had an opportunity of ſeeing an attempt made to cut out a piece that was diſeaſed, near the middle of the thigh bone. To do that with the common ſaw, was next to impoſſible; for the wound neceſſary to allow the ſkin and fleſh to be depreſſed ſo much on either ſide of the bone, that the ſaw could be applied, muſt have been made to extend almoſt from the knee to the groin. A ſaw, therefore, was prepared, of a different kind, to raſp the bone acroſs, without hurting the fleſh; but the difficulty that attended the execution of this operation, the time ſpent in performing it, and the pain which,

notwithſtanding all the care that was taken, the patient ſeemed to ſuffer, made ſuch an impreſſion on me, that I could not reſt from thinking of ſome method, by which bones might be cut out more eaſily; and at laſt I conceived it to be poſſible, that a ſaw might be conſtructed, with joints like the chain of a watch, ſo as to allow itſelf to be drawn through behind a bone by a crooked needle, like a thread, and to cut the bone from behind forward, without injuring the ſoft parts. A drawing of this ſaw was accordingly made; but it was not till ſome years thereafter, that I got one executed in London by Mr RICHARDS, who was aſſiſted in making it by his nephew, the preſent Mr RICHARDS of Brick Lane. In the mean time, a ſketch of ſuch a ſaw was publiſhed by Dr JOHN AIKEN of Edinburgh. I do not know that any other ſaw of the kind has ever been made, except one that I got made lately, of a larger ſize. The one, of which the Drawing is annexed *, has been uſed here annually in the Anatomy Claſs, ever ſince the year 1790, and has been occa-

* See Plate III.

ſionally lent to ſurgeons, by whom it has been uſed in operations; but there is no purpoſe to which it is ſo well fitted, as that for which it was originally intended, viz. the Exciſion of Bones from Carious Joints: of courſe, whenever an opportunity offered here, for ſhewing the manner in which Mr PARK's operation is directed to be performed, this ſaw, and the manner of uſing it, which is extremely ſimple, has been annually exhibited.

Having brought the bone that is to be cut fairly into view, by inciſion, the fleſh is to be ſeparated from it all around, and by the finger if poſſible. The needle, which, it is ſcarcely neceſſary to ſay, ſhould be blunt at the point as well as on the edges, at the ſame time that it ſhould be elaſtic, and adapted, in curvature and ſize, to the depth of the wound and the diameter of the bone, ſhould then be taken in the right hand; and, its point being brought to touch the ſurface of the bone on the right ſide, ſhould be paſſed behind, and in contact with the bone, till, ſweeping a half circle, it be felt or ſeen in contact with the bone at the other

ſide, where it now may be laid hold of, and drawn through. While the ſurgeon is thus employed in paſſing the needle behind the bone, his aſſiſtant ſhould attend to the ſaw, by letting it run through between his finger and thumb, ſo that its cutting edge ſhall be towards the bone. The ſaw being brought through, the needle is to be removed, and the handles hooked on. The ſurgeon ſhould now place himſelf in a poſition, to have the full uſe of all the muſcles of his arms; and, having tried the ſaw gently, to ſee that its ſide is not to the bone, he ſhould draw one end of it towards him ſmartly with one hand, and then the other with the other, till it cut the bone through; during which operation, the aſſiſtants ſhould hold one end only of the bone fixed, for, if they preſs upon both, they will lock the ſaw, and retard the operation. The execution of the ſaw will be found to exceed expectation; for, as it is applied round one half of the bone, its cut is extenſive. When, however, the bone is ſawed nearly through, the ſurgeon ſhould either keep his hands farther ſeparated from one another

than he found it neceſſary to do at the beginning; or he ſhould give one handle of the inſtrument to an aſſiſtant, and retain the other himſelf, that they may ſtretch out the ſaw, and thereby make it more like a ſtraight ſaw, as it approaches the anterior ſurface of the bone, leſt, being then bent too ſharp, it break; of which, however, if the force exerted be not unneceſſarily great, I can ſay there will be very little danger, having now uſed, and ſometimes roughly, the ſame ſaw for theſe fifteen years paſt, without either ſharping or mending.—From the account which I had in my power to give of this inſtrument to Mr PARK, he was convinced, that in his operations it would have done him eſſential ſervice; and, on conſidering attentively the very accurate ſtatements which Mr MOREAU gives, of the difficulties he and his father met with in cutting the bones, there is reaſon to believe, that it would have been ſtill more uſeful to them.

The next circumſtance to which I would direct your attention, is the difficulty which both Mr PARK and Meſſrs MOREAU found in

making their inciſions, ſo as to lay the bones bare, that they might be expoſed to the action of the ſaw, and yet ſpare the attachment of the muſcles.

Mr PARK, in his experimental operation on the Elbow Joint, found, that when he made a ſimple longitudinal inciſion (p. 7), from about two inches above to the ſame diſtance below the point of the olecranon, he could not, after he had raiſed the integuments, divide the lateral ligaments or diſlocate the joint: he was obliged to ſaw the olecranon off. And, before Mr MOREAU could get the bones ſufficiently expoſed to the action of the ſaw, he found it neceſſary to make two longitudinal inciſions, one on each ſide, beginning ſome inches above, and carried as far down below the joint; and theſe he laid into one, by a tranſverſe cut: by which means, he could raiſe one flap by diſſection, and turn it up, and the other he could turn down, whereby the joint was doubtleſs brought fairly into view; ſo that the bones could not only be accurately examined, but they were completely expoſed to the action of

the ſaw. You will not fail, however, to obſerve, that the triceps extenſor ſuffered equally in both caſes; ſo that, to the patient, it could make no great difference, whether the tendon of the triceps was cut acroſs immediately above the olecranon, in Mr MOREAU's way; or whether its attachment was deſtroyed, by ſawing the olecranon off, according to Mr PARK's plan; for in either caſe, his chance for regaining the power of extending his arm, could be but ſmall. This would be a matter of no moment, if the cut ends of the bones were to grow together; for then the joint would be ſtiff, and the power of extenſion, though loſt, would not be miſſed. But though, in all the caſes given, both by Mr PARK and Mr MOREAU, it has uniformly happened, that the bones at the knee joint have grown together, and the joint has remained, after the operation, ſtiff for life; yet MOREAU has ſhewn, that things do not go on in that way at the elbow. In all the caſes, of which he gives an account, the patients recovered the power of bending that joint.

In Caſe III. (p. 114), the greater part of the bones of the joint were allowed to remain; and the external half only, of the tendon of the triceps muſcle, was cut, which, in all probability, ſoon became continuous again; therefore, in that caſe, it was not ſurpriſing that the power of extenſion was regained.

In Caſe II. the tranſverſe inciſion was carried acroſs, above the olecranon, from the ſpinous proceſs of the os humeri on one ſide, to that on the other, penetrating to the bone. After the cure, the flexion of the fore-arm on the arm was very diſtinct; but, with reſpect to extenſion, nothing is ſaid, from which, as Mr Moreau is very accurate in deſcribing the motions that were regained in all the other caſes, there is reaſon to believe that this patient could not extend his arm.

But Caſe I. is the moſt remarkable. The arm being in a ſtate of ſemiflexion, he plunged the ſcalpel in upon the ſharp edge or ſpine of the inner condyle of the os humeri, about two inches above its tuberoſity; and, directed by the ſpine, he carried the inciſion down to the joint. He

did the ſame on the other ſide. He then laid the two wounds into one, by a tranſverſe inciſion, which cut through the ſkin *and the tendon* of the triceps extenſor cubiti, immediately above the olecranon; and ſawed off one piece of bone from the end of the os humeri, and then another, which, if the drawings of them be from nature, as they are ſaid to be, were upwards of two inches and a half in length; and, having extended his lateral inciſions downwards, he ſawed off about an inch and a half from the ulna, meaſuring from the tip of the olecranon downwards. Yet even in this caſe, the motions of the joint, though impaired, were not loſt. The bones of the arm and fore-arm, after the cure, were found to be at ſome diſtance from one another. The flexion of the fore-arm upon the arm was ſtrong, firm, and ſteady; the attachment of the biceps, and a conſiderable number of the fibres of the brachiæus internus, having been ſpared. The bones of the fore-arm had grown together; yet, though the motions of pronation and ſupination were not perfect, the man could perform them, the fleſh which filled up

the ſpace between the bones of the arm and fore-arm yielding, as it were, by twiſting; and the motion was extenſive.

Mr Moreau is at a loſs to diſcover how this motion could be produced, as the radius adhered to the ulna; but it ſhould be remembered, that in this operation, the ſupinator radij longus was not diſturbed (p. 107). It ſhould alſo be recollected, that the biceps, which is a ſemiſupinator, was not injured; and, though the pronator radij teres originates chiefly from the inner condyle of the os humeri, along with the flexor carpi radialis, it ſhould be obſerved, that there is a ligamentary cord attached to the inner condyle, from which a conſiderable number of the fibres of the pronator riſe. This ligament, as it proceeds up along the inſide of the arm, expands into a flat aponeuroſis; one edge of which looks towards the bone, to which it adheres, near the inner ſide of the attachment of the deltoid, a number of the fibres of the brachiæus internus riſing from its anterior ſide, and the fibres of the triceps extenſor riſing, in like manner, from it behind: while the

other edge, which looks towards the ſkin, gradually expands into a covering for the inner ſide of the arm, eſpecially near the axilla, and, ſpreadading out, is loſt upon the breaſt.—From the lower end of this ligament, where it is attached to the inner condyle, ſo many of the fibres of the pronator radij teres riſe, that, in attempting to lay the condyle bare, this ligament, which lies anterior to the longitudinal inciſion, muſt, as well as the pronator radij teres, be raiſed from the condyle by diſſection; and they riſe, adhering together by no narrow connection.

This being the caſe, it will be ſeen, that, by detaching the pronator from the condyle, if done with caution, the inſide of the os humeri, near the deltoid, comes to be, through the medium of this ligament, the point to which the upper end of the pronator muſt be conſidered as attached; and, as this point is ſituated nearer than the condyle, to the axis of the arm, the body of the muſcle in action will not lie ſo obliquely acroſs the joint, as it did before.—But, notwithſtanding that, its power of acting

on the radius will be thereby only leſſened; and, if it be conſidered, that though, as the radius and ulna had grown together, pronation could no longer be effected in the uſual way, by the radius ſweeping round the ulna; yet, as both the pronator teres, and flexor carpi radialis, were ſtill connected with the inner ſide of of the os humeri, and croſſed the joint, though leſs obliquely, to be inſerted into the outer edge of the radius, both the bones of the fore-arm, as they adhered together, muſt, when theſe muſcles acted, have turned prone, becauſe the new formed fleſh, interpoſed between the bones of the arm and fore-arm, yielded by twiſting. At the ſame time, it is evident, that, by this movement, the ſupinator radij longus, and the biceps, muſt have been put on the ſtretch; nay, the brachiæus, which formerly had nothing to do, either with pronation or ſupination, muſt now, by this new rotatory movement of the ulna, have been obliged to twiſt alſo; ſo that, when the muſcles of pronation ceaſed to act, the man would find very little difficulty in turning the hand ſupine.

But the circumſtance which, in this caſe, I find the moſt difficult to be underſtood, is, that the man regained, in a conſiderable degree, the power of extending his arm. Mr Moreau, ſtruck with this, ſeems to think, that ſome of the fibres of the triceps extenſor had been ſpared. But it is ſcarely poſſible to conceive, how any of the fibres of this muſcle could have eſcaped the knife, in making ſuch an inciſion as that which he deſcribes the tranſverſe inciſion to have been; for it began at the ſpinous edge of the os humeri on one ſide, and, paſſing acroſs the poſterior ſurface of the bone, immediately above the olecranon, it terminated at the ſpine on the other ſide: and even, if, in making this inciſion, any of the fibres of the muſcle, all of which lie on the poſterior ſurface of the bone, had eſcaped the knife, they muſt have been deſtroyed by the ſaw; as the olecranon itſelf, and two inches and a half from the lower end of the os humeri, were cut off by the common ſaw, which, in cutting through the bones, would divide every thing that came in its way.

We would be ready to believe, that during the cure, the tendon of the triceps had formed a new adheſion with the ulna; or that the end of that ſide of it, at leaſt, which is fleſhy, and is continued into, or rather ſends off the anconæus, had re-united to what remained of the anconæus, which adheres for ſome way down on the ulna, below where it had been cut. But it is ſaid that the bones were not in contact, and that the body of the triceps was very much waſted, which had occaſioned a hollow at the inferior and poſterior part of the arm;—yet, unleſs the extenſor had formed ſome new connection of this kind, or had adhered to the ſkin, or to the fleſh, which, it is ſaid, had grown between the bones of the arm and fore-arm, it is difficult to conceive how the power of extenſion could have been reſtored.

The information which the caſe holds forth, is, that the conſequence of exciſion at the elbow is not neceſſarily a ſtiff joint; but that, on the contrary, the motion of flexion always remains; that pronation and ſupination are ſometimes regained; and, that even extenſion, when leaſt

expected, is partially recovered; and the leſſon that we get from the whole is, that we ſhould ſpare the muſcles if we can;—which leads me to ſtate, that, except in caſes where the bones are ſo extenſively diſeaſed throughout, that the attachment of the muſcles is either already deſtroyed or muſt be deſtroyed in removing the carious parts, the operation may be performed, and eaſily too, by the chain ſaw, without injuring the extenſor of the arm.

It may be ſaid, that though it be an object of importance to preſerve the attachment of the extenſor muſcles, in elbow caſes, where the joint remains moveable, the ſurgeon may conſult his own convenience at the knee, becauſe that joint, after the operation, is ſtiff. But it ſhould be conſidered, that though the cruræus and the vaſti be extenſors of the leg, their auxiliary, the rectus femoris, is a flexor of the hip joint alſo, and, of courſe, a bringer forward of the thigh; and to loſe the uſe of that muſcle, in walking, &c. muſt always be a ſerious inconvenience, whether the knee joint be ſtiff or not; becauſe it acquires power by con-

traction,—the length of the lever, with which it acts, increasing as the muscle becomes shorter: whereas, most of the other flexors of that joint lose power, their lever decreasing, in proportion to the decurtation they suffer in acting. Except, therefore, it be supposed, that the ends of the common tendon of the extensor muscles, when cut above the patella, or the ends of the ligament that connects the patella to the tibia, unite after the operation, it is obvious, that, by the transverse incision, the power of bringing forward the limb must be impaired.

The question, then, comes to be, Whether do the tendons unite after the operation, or not? That they unite in some cases, is probable; that they will not unite in others, is possible. Until the point, therefore, be settled by the dissection of many limbs, in which the operation has been performed, the matter must remain as it is now, a question of mere convenience with the surgeon.

But if, in the meantime, it can be shewn, that the bones may not only be brought into view for examination, but be sufficiently ex-

poſed to the action of the ſaw without the tranſverſe inciſion, by which alone the extenſor muſcles ſuffer, you will, I am perſuaded, agree with me, that the operator ought not to put the facility with which he may be able to perform the operation, in one way, in competition with the benefit which the patient muſt receive from it, if done in another manner.

Recollect, then, the relative ſituation of the different parts about the joint; and you will find, that, by making two longitudinal inciſions only, one on each ſide, and of ſufficient length, as practiſed by Mr MOREAU, the chain ſaw can be entered at the wound on one ſide, and be conducted by the needle, acroſs and in contact with the upper ſide of the bone, to the wound on the other; and from thence it can be brought back, under the bone, with equal ſafety and eaſe. You have ſeen the ſaw applied in this way, to the bones below the joint, as well as to thoſe above: and though the ſwelling of the parts muſt render every ſtep of the operation more difficult in real practice, than on the ſound limb of a dead ſubject, yet I perſuade myſelf

you are convinced, from what you have ſeen, that, however neceſſary it may be to lay the two lateral inciſions into one by a tranſverſe cut, before the ſtraight ſaw can be applied, few caſes will occur, requiring a tranſverſe inciſion, if the chain ſaw be uſed.

This, I cannot but conſider as a great point gained. It not only diminiſhes the cutting, but keeps us free from all fear and trouble reſpecting the flaps; and it puts it in our power, when the ends of the bone are laid in contact, to bring the lips of the wounds at the ſides ſo accurately together, that we may, in ſome caſes, hope for a cure, as in Mr PARK's caſe (p. 70), by the firſt intention.

It remains, then, that we conſider, Whether the difficulties in performing the operation with two lateral inciſions, be greater than the benefit to be derived from ſparing the extenſor muſcles?

Mr MOREAU has given two caſes, of exciſion at the Ankle Joint, which throw much light on the ſubject. In theſe caſes it was, and in all ſuch caſes ever will be, difficult to avoid the

tendons, the blood veſſels, and the nerves. If a tranſverſe inciſion be attempted, either before or behind the joint, they muſt ſuffer. He made no tranſverſe inciſion, but, directed by the courſe of the tendons, he made two crooked lateral inciſions; and, raiſing the flaps, ſo as to lay the bones bare, he ſtruck off the end of the fibula, with a chiſel; then, by raiſing the integuments from the tibia before, and paſſing a ſcalpel through between the tibia and the fleſh behind, he got the blade of a narrow ſtraight ſaw, fixed in a handle, introduced; and cut the bone, ſawing from before backward, which, he ſays, was a work of no ſmall trouble (p. 143). That being done, he turned the foot outward, and, making the piece of bone, which he had cut off, project, he detached it from the joint without difficulty.

The queſtion, then, for your conſideration, is, Whether, what he thus did at the ankle without difficulty, and with inſtruments not very well adapted for the purpoſe, may, or cannot, be done at the knee and the elbow, with the flexible ſaw?

If the lateral inciſions be made long enough, as they ought always to be, I can ſay, you will find no difficulty in cutting the bone with the chain ſaw. You will find it ſtill more eaſy to divide the lateral ligaments, becauſe they preſent themſelves to your view. The greateſt difficulties which you may expect to meet with, will be that of cutting the capſular ligament, and of ſeparating the fleſh from the bone, before and behind. But here you will recollect, that at the elbow joint, the triceps extenſor is not connected to the poſterior part of the os humeri for ſome way above the joint, and the brachiæus internus is equally free from it for ſome way before. It is the fleſh, therefore, at the ſides only of the elbow joint, along the ſpinous edges of the os humeri, and at the condyles, that you will, in the firſt inſtance, have to detach from the bone; and in this you can find no difficulty, for it will be as eaſy as raiſing a flap.

The only difficulty, then, that remains, is that of cutting thoſe parts of the capſular ligament which are covered by the fleſh, and the ſkin on the fore and back part of the joint. And here

you may conſider, whether the diſtance from the one ſide of the joint to the other, at the ankle, be very much leſs than at the elbow.—Mr MOREAU does not ſay that he found much difficulty in cutting the capſular ligament of the tibia there. But let it be ſuppoſed, that the ſoft parts are very much tumified, and that you cannot eaſily get the ligament, eſpecially at the back part of the joint, divided, while the bones are in ſitu; you ſtill can, by having previouſly cut the os humeri above the joint, make the cut piece project, as Mr MOREAU did, when he found no difficulty of removing the piece which he had cut at the elbow. Or, if the contraction of the flexor and extenſor muſcles be ſo ſtrong, as to draw up the inferior part of the limb ſo powerfully, after you have made the bone project, that you cannot get the cutting edge of your ſcalpel or biſtoury introduced with ſafety, between the fleſh and the bone; you ſtill have it in your power to introduce a concealed biſtoury, and eaſily to cut one half of the capſular ligament, either before or behind, at one ſide, and the other half at the other.

Or, ſuppoſing that you find it difficult even to do that, and that the bones have grown together in the joint, as ſometimes happens during the diſeaſe, you can lead your flexible ſaw through by the needle, between the fleſh and the bone, and, with it, you can cut from behind forward, both the capſular ligament and bony adheſions. If the os humeri has adhered to the olecranon behind, and, anxious to ſave the extenſors, you wiſh to ſave the olecranon, part of it, at leaſt, being ſound, you can, by detaching the ſkin from its ſides, lay it ſo completely bare, as to be able, even when the parts are greatly thickened, to paſs your chain ſaw behind the os humeri, and, by cutting downwards, detach it from the olecranon; ſo that the cut piece of the os humeri, being thus inſulated all around, will be eaſily forced out of the joint. And now, the extenſor muſcles being ſafe, you will be able to turn out the ends of the os humeri and ulna for examination, and proceed in the operation, as the circumſtances of the caſe may direct.

Here, I think, you will not forget, that the olecranon receives its nouriſhment from the ſoft

parts that are connected with it behind. Its hooked point, and its articulating ſurface, are, in general, the parts of it which are diſeaſed. Theſe, as Mr Moreau did, you can ſaw off or pare away; and, if you leave only the perioſtium, and the tendonous fibres of the triceps that expand out into the faſcia of the arm, there will be hope left, that the power of extenſion will not be loſt. If, however, the olecranon, and ſo much of the ulna, be diſeaſed, that even by the anconæus and tendonous expanſion of the triceps, the extenſion of the arm cannot be ſaved, you will have the ſatisfaction to think, that you have done all in your power to preſerve it.

Mr Moreau (p. 101, note) ſtates the difficulties of cutting the fibula and ulna with the common ſaw, thus:—"The bones of the fore-"arm muſt be cut with a ſmall ſaw. The fleſh "comes too much in the way of a large ſaw. "The ſmall one is difficult to manage; but "what better can we do? And, when you add "to this, the riſk of cutting the veſſels, which, "at this place, paſs through the interoſſeous li-

" gament, you will ſee how difficult this opera-
" tion muſt be."—No words, that I can uſe, could ſet the advantages of the chain ſaw, in cutting the bones, whether of the fore-arm or the leg, the wriſt or the ankle, in a clearer point of view. It can, in all theſe ſituations, be led through between the arteries and the bones, without doing injury to either; and, as it cuts *from* the artery, it can, while the artery is drawn aſide, be ſunk into the bone by a few pulls, after which the artery is out of all danger.

You may perhaps think, that though, in this way, the blood veſſels may be avoided, and the muſcles ſpared, at the elbow, it will be impoſſible to perform the operation in the ſame manner at the knee. The knee joint is, indeed, larger than that of the elbow, and is, in ſeveral reſpects, differently conſtructed; but, if you recal to recollection what you know about the knee, you will find, that the ſame principles which direct the practice in the one caſe, apply equally to the other. The os femoris muſt be cut, before you can expect to diſlocate the joint; and to do this with the chain ſaw, it is

not neceſſary to lay the joint open, by cutting the tendon of the extenſors above, or the ligament of the tibia below the patella.

The popliteal artery lies far from the bone. You will find it no very difficult matter to divide that part of the capſular ligament, called the lateral ligaments, for theſe will preſent themſelves at the lateral wounds to the knife: nor can you find much difficulty in raiſing the ſkin that covers the capſular ligament before, all the way up along the edges of the femoral pulley, to the upper end of the patella; and behind, along the edges of the condyles, as far up as the heads of the gaſtrocnemius muſcle. To go farther up, either behind or before, or to detach the gaſtrocnemius muſcle behind, or cut the capſular ligament of the patella at the upper end of the femoral pulley, will not be neceſſary, at leaſt at firſt, becauſe you will generally find it convenient, whether the diſeaſe has advanced higher up or not, to cut the bone immediately above the condyles. To do this, you will find it very eaſy to conduct the ſaw by the needle, through between the bone and

the patella before; and close to the bone, immediately above the condyles, below the heads of the gastrocnemius muscle, behind; and to saw off the whole of the large lower end of the os femoris at once: and, if you press the head of the cut piece to one side, through either of the lateral wounds, you will be able to raise, and even to put a wedge in below, the under part of the bone at the other side, so as to be able to get the point of the curved probe-pointed bistoury introduced between the bones, and to cut the crucial ligaments within the joint. The bone being now detached from all its natural adhesions, you will, in most cases, be able to force it out of the joint by pressure, as the glenoid cavities of the tibia are shallow; but, if the contraction of the muscles be strong, you will find no difficulty in knocking out the cut piece, by a jerk or a blow.

Let it be supposed, however, that during the progress of the disease, the surface of the inflamed bones has adhered, by the induration of effused osseous matter; and that the piece which you have cut off from the os femoris has grown

to the tibia, ſo firmly, that it cannot be forced out of the joint. In ſuch a caſe, which is by no means uncommon, the ſurgeon who operates in the uſual manner, will be obliged to diſſect away the fleſh from behind the bone in the ham, which will not be eaſily done, and he will find it neceſſary to introduce ſome ſolid ſubſtance behind the bone; then, having preſſed back the ſkin and the fleſh at the ſides, he muſt cut through the preternatural adheſions at the joint, by ſawing backward towards the ham.—But you will meet with no difficulty here. You will paſs your needle acroſs the joint behind, and lead your ſaw at once into the channel between the two heads of the bones; and again paſſing it acroſs the joint, between the patella or its ligament and the bones before, you will bring its cutting edge to bear upon the adheſions between the bones; and, ſawing inward, towards the centre of the joint, you will, without riſk to any of the ſurrounding parts, cut through the preternatural adheſions, the crucial ligaments, and whatever elſe may be in the way.

The piece of bone being removed, the condition of the remaining parts can be examined, by bending the new-formed joint, turning out the ends of the bones, and twiſting the anterior flap, if I may call it a flap, at the knee, thereby bringing the patella into view.

If that bone be diſeaſed throughout, you can remove it as eaſily as if you had laid open the joint by a tranſverſe inciſion. If it be only partially affected, you can, with the gouge, pare away the diſeaſed parts. But if it be ſound, you will, by your caution, in gaining, as Mr Moreau ſays, the power of ſtopping ſhort, have done your patient an eſſential ſervice.

If the os femoris be diſeaſed higher up, it can now be laid bare without riſk, becauſe the finger can be introduced to guard the ſoft parts, and direct the knife; and the ſaw may be applied again, with the utmoſt facility. It has, indeed, been a good deal uſed, in operations of a ſimilar nature,—ſuch as cutting off the carious or protruding ends of bones from ſtumps, in caſes of ſloughing after amputation—removing angular pieces from bones, in caſes of com-

pound fractures—cutting out pieces of bones, in cafes of necrofis—and fawing off the callous extremities of bones that would not unite after fractures;—for which purpofes, it is found to be particularly well adapted.

Mr Moreau, after he had extended his lateral incifions downward, and raifed his inferior flap, was obliged to ftrike off the difeafed head of the fibula with a chifel. You will be able to do this lefs violently, and more correctly, with the flexible faw; and, as you can apply it to the head of the tibia, on any fide, and cut with it at any angle, you will have it in your power to take away all that is difeafed (fpots and cancelli excepted), and no more than what is difeafed; though, for obvious reafons, you will fee that both the os femoris and tibia fhould be cut directly acrofs; for then, notwithftanding that more may be loft than was actually difeafed, you will have it in your power to bring the ends of the bones into more extenfive and intimate contact.

The laft circumftance in this operation, to which I wifh to turn your attention, is the prefervation of the nerves.

The blood veſſels, you have ſeen, are not in the way of danger. Mr MOREAU never found it neceſſary to take up an artery; and in Mr PARK's ſecond caſe, two arteries only required the ligature. The muſcles have, indeed, ſuffered ſeverely; but that, you have ſeen, was neceſſary for the application of the ſtraight ſaw.

The nerves are mentioned directly, in one caſe only, viz. the firſt of Mr MOREAU (p. 107), where it is ſaid, that the cubital nerve had been cut in the operation; and, as might be expected, the conſequences were, that the back of the hand had evidently waſted, and the little finger had no feeling. Such conſequences muſt always inevitably follow, more or leſs, in proportion to the injury done to the nerves. Therefore, as the benefits reſulting from the operation, when performed ſucceſsfully at the elbow, are greater than when performed at any other joint; and as it is, on that account, probable, that the operation will be performed more frequently at that joint than anywhere elſe, you will be ſenſible of the propriety of turning your attention to the courſe of the ulnar nerve,

which, from its ſituation at the inner ſide of the elbow, is particularly in the way of the knife, in making the internal longitudinal inciſion.

The internal ſpinous proceſs of the os humeri terminates in, or may be ſaid to enlarge into, the inner condyle. The ulnar nerve comes down along the inner ſide of the arm, inclining backwards, till it get behind the ſpinous edge of the bone. It then continues its courſe, and, receding ſtill farther behind the ſpinous proceſs, as it deſcends, it paſſes behind the inner condyle,—where, when the arm is bent, it is ſunk in between the condyle and the inner ſide of the triceps extenſor, and is covered only by the thin faſcia of the arm and the ſkin. After it paſſes the joint, it advances gradually forward, to run down on the fore part of the ulna.

Theſe circumſtances being kept in remembrance, you will underſtand how the cubital nerve came to be cut in Mr Moreau's firſt operation; and you will ſee how, if you wiſh to preſerve it, you ought to proceed.

The arm being in a ſtate of ſemiflexion, which is generally the caſe if the complaint has been of long duration, he plunged his ſcalpel in upon the ſharp edge or ſpine of the inner condyle of the os humeri, about two inches above its tuberoſity; and, directed by the ſpine, he carried the inciſion down to the joint. By taking the ſpine for his guide, you will perceive that the inciſion muſt have paſſed down, anterior to the nerve. He made a ſimilar cut on the other ſide, and then laid the two into one, by a tranſverſe inciſion on the poſterior part of the joint, immediately above the olecranon; by which means, the ulnar nerve muſt have been inevitably divided.

If, therefore, you wiſh to perform the operation in Mr MOREAU's way, you would do well to bear theſe things in your remembrance; but if, from what has been ſaid, you would rather chuſe to avoid the tranſverſe inciſion altogether, the following circumſtances deſerve attention.

If the inciſion be made farther forward than the nerve, you will find it difficult to carry it far below the joint, as the nerve, in croſſing to

the fore part of the ulna, will come in the way; and, if you make the inciſion at a conſiderable diſtance behind it, you will find it in your way in raiſing the muſcles and ſkin, in order to get the condyle laid bare. This ſhews, that the courſe of the nerve is nearly that which the inciſion ſhould follow. You need not be alarmed at this, for you will run leſs riſk of wounding the nerve by ſeeking it, than by trying to ſhun it. It is large, and you cannot miſs it: It is white, and you muſt eaſily ſee it: It lies cloſe to the bone at the back of the inner condyle, where you will be ſure always to find it: It is held in its place by cellular membrane, which you can eaſily ſeparate; and, if you follow it, keeping the edge of your knife inclined a little away from its poſterior ſide, you will find that your inciſion, which will thus run along the poſterior ſide of the nerve, will be in the moſt convenient ſituation. You will now be able to raiſe the nerve; and, by cauſing it to be drawn either to the one ſide or the other, as you may find neceſſary, you will have it in your power to lay the bones bare, and to open

the joint, without fear of injuring the nerve.—As the ſaw may be applied to either ſide, you will find it moſt convenient, as well as ſafe, to introduce it by the needle, from the outer ſide, for then, in cutting the bone, you will ſaw from the nerve.

Theſe are the principal obſervations which I have at preſent to lay before you, on this difficult and important operation;—from which, I truſt you will ſee, that fortunately the blood veſſels are not in much danger;—that to remove the diſeaſed bones, is indeed the firſt, but by no means the only object, to be kept in view;—that you ſhould endeavour to ſpare the muſcles, and alſo the nerves. To do that with the inſtruments in common uſe, is almoſt impoſſible.—How far it can be effected, by means of the ſaw which has been propoſed, time muſt ſhew.

I have the honour to be,

GENTLEMEN,

Your moſt obedient and
humble ſervant,
JAMES JEFFRAY.

GLASGOW,
April 25, 1806.

EXPLANATION OF THE PLATES.

PLATE I.

This plate represents, of their natural size, the pieces of bone that were removed from the patient who was the subject of Case I. in M. MOREAU's work.

Fig. 1. The inferior extremity of the os humeri, viewed from before. It is seen to be enlarged, and a good deal diseased.

Fig. 2. The inferior extremity of the os humeri, viewed from behind. At the upper and outer border of the cavity for the olecranon, a hollow may be observed. This was produced by the gouge, which was used, in order to ascertain the colour of the bone.

Fig. 3. The second piece of the os humeri, viewed from before.

Fig. 4. The same piece, seen from behind, where it is somewhat diseased.

Fig. 5. The upper end of the ulna, seen from the inside.

Fig. 6. The same, seen from the outside. The two articulating surfaces are destroyed by caries.

Fig. 7. The upper end of the radius, shewing the cut made by the saw.

Fig. 8. The upper end of the radius, shewing the glenoid cavity, which is destroyed by disease. The

oblique cut, by which he was enabled to save the attachment of the biceps, may be perceived.

PLATE II.

This drawing represents the actual appearance of the arm, which was the subject of Case I. It is seen from the outside. The scar of the external lateral incision, and a part of that of the transverse, may be seen. The natural dimensions have not been preserved.

PLATE III.

Fig. 1. A view of the piece that was sawn off from the os humeri, mentioned in Mr PARK's Subsequent Observations, seen from before.

Fig. 2. The same, seen from behind.

Fig. 3. A view of the piece that was broken off from the os humeri, seen from before.

Fig. 4. Posterior view of the same.

Fig. 5. The chain saw, rather less than nature, with one of its handles, and the needle, which is represented a little too straight and too sharp.

Fig. 6. Its other handle, to be hooked on when the needle is taken off.

Fig. 7. A side view of part of the saw, magnified, in order to shew how it is constructed.

Fig. 8. A back view thereof, to shew the three pieces, of which each joint is composed.

FINIS.

ERRATA.

Page 130, line 21.—After the word inciſion, *read* on each ſide of the thigh.

Page 132, line 4.—*For* outer ſide the knee, *read* outer ſide of the knee.

TO THE BINDER.

PLATE I. To face page 100.
—— II. To face page 106.
—— III. To face page 175.